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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1992

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

ON

H.R. 2521

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF DEFENSE FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1992, AND FOR OTHER PURPOSES

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CONTENTS

THURSDAY, APRIL 11, 1991

Page

Department of Defense: Department of the Air Force, Office of the Assistant Secretary for Acquisition 849

TUESDAY, APRIL 16, 1991

Department of Defense: Department of the Army, Armored Systems Modernization Program 935

THURSDAY, MAY 7, 1991

Department of Defense:

- U.S. Air Force, Strategic Air Command 965
- Strategic Defense Initiative Organization 999

WEDNESDAY, MAY 8, 1991

Congressional Budget Office 1053
Department of Defense: Department of the Navy 1083

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1992

THURSDAY, APRIL 11, 1991

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9 a.m., in room SD–192, Dirksen Senate Office Building, Hon. Daniel K. Inouye (chairman) presiding.

Present: Senators Inouye, Johnston, Leahy, Bumpers, Stevens, D'Amato, and Specter.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE AIR FORCE

OFFICE OF THE ASSISTANT SECRETARY FOR ACQUISITION

STATEMENT OF HON. JOHN J. WELCH, JR., ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION

ACCOMPANIED BY MAJ. GEN. STEPHEN B. CROKER, DIRECTOR OF STRATEGIC, SPECIAL OPERATIONS, AND AIRLIFT PROGRAMS, U.S. AIR FORCE

OPENING STATEMENT OF SENATOR INOUYE

Senator INOUYE. The subject of this morning's hearing is the B–2 advanced technology bomber program, the so-called stealth bomber. In the President's budget request for fiscal year 1992, more than $4.7 billion is requested for continued development and production of four B–2 bombers. This amount makes the B–2 second only to SDI as the most expensive program in the defense budget request.

The enormous funding level makes it imperative that the committee give this program its full consideration. The B–2 stealth bomber is one of the most controversial programs in the budget, precisely because of its high cost. The Air Force currently plans to purchase 75 B–2 bombers. If purchased as scheduled, the procurement cost for each B–2 bomber would amount to more than $550 million. The total program, including research and other costs, would be $64.7 billion.

With such high costs, the B–2 will continue to be of concern to many Americans. So I trust that our witnesses will be able to inform the subcommittee why the program is so expensive and what efforts the Air Force is taking to control costs.

Nonetheless, it is important to review this program on its merits, rather than focus exclusively on costs, for if history has taught us one lesson it is that the cost of maintaining peace is never as high as the cost of war.

The B–2 bomber represents the third generation in one of the most promising defense areas—stealth technology. It is clear from the success of the F–117 in Desert Storm that stealth technology can be an effective force on the battlefield.

Our witnesses this morning need to explain fully why the B–2 is required to supplement the capability that already exists with F–117's and conventional strategic bombers. In our review, we also expect the Air Force to address the progress of the B–2 in production and testing so that we may better understand how the dollars previously appropriated have been used.

To help us in this endeavor, the subcommittee is pleased to welcome the Honorable John J. Welch, Assistant Secretary of the Air Force for Acquisition, and Maj. Gen. Stephen B. Croker, Director of Strategic, Special Operations, and Airlift Programs.

Mr. Secretary, it is always good to have you with us, sir. You may proceed as you wish.

SUMMARY STATEMENT

Mr. WELCH. Mr. Chairman, members, General Croker and I are pleased to appear before you this morning in a somewhat different forum than I think we have been able to talk to the B–2 before, in an unclassified forum. I think that is a real testimony to both the committee and, hopefully, to the Air Force, that we have met the objective set for us, to take those things which really must have good solid scrutiny, not only the programmatics but the performance, et cetera, and be able to put them before you today and, in fact, address the very key items that you spoke to us about.

I do have a statement which I would like to put into the record with your concurrence, sir.

Senator INOUYE. Without objection, your statement is made part of the record.

Mr. WELCH. We have tried to approach the material that we have to discuss today by putting it together in an unclassified document which we have before you up there. It was our intent—and I would like to, perhaps, briefly leaf through that document with you to try to show all of the items which we believe have been presented to us as issues. Obviously, we would not take the time to go through the detail of each page, but to illuminate those key issues, and we then can come back and discuss the ones that you consider in priority.

IMPACTS OF STEALTH TECHNOLOGY

If I could ask you to perhaps leaf through this with me. On page 2 of the overview we have tried to capture what we believe for the future will be the impacts of stealth technology. We had the opportunity recently with the F–117, as you pointed out, to, in fact, not only show that those successes and that performance is available to us today, but, in fact, how that laid the foundation for what I think you have captured, in that there are three generations certainly in the aircraft field of stealth technology.

A little bit different way, perhaps, to look at those three generations, since they really are a F–117 fighter, a B–2 bomber, and an ATF fighter, is that they really are not only three generations, but each one will become a leader in the application of this technology to its mission area, because we are capturing fighters in the bombers. And I think that we have not yet fully captured all of those things that we learned as we develop a generic series of applications within each of those mission areas.

So not only are there three generations, I think there are three mission areas that we are working very hard to take this application.

Stealth is simply another way, really, of capturing surprise, and I think people have been willing to accept for many centuries that surprise is a fundamental part of warfare. We have many products that we simply illustrate here of how surprise has been manifested: aircraft and submarines, going with the jet engine higher and faster, smart bombs, and finally, now the somewhat analogous situation of low observability, whether one achieves that in the medium of water as the submarines do or in the, perhaps, more difficult medium of the air.

Perhaps a simpler way as we have become smarter in defensive technologies, what defense has done is to take away essentially the operating space that is available to conduct combat by essentially shrinking the threat. We show this over the next few pages—opening the battlefield up again.

By being able to use the performance capabilities of aircraft, we really are capturing the idea, whether it is a one-on-one type of engagement where we can avoid defenses, or where defenses are, in fact, linked together as a fence or a wall; we can shrink down those connections and make the paths so people can, in fact, use this technology to go to their target.

The next several pages—you can kind of leaf through—will show pictorially how we are trying to really recover battle space so that we can then use all of the other systems more effectively.

A very simple analogy was the business of moving from the day to the night and all of the advantages it gave us. It is another, in the visual sense, way of trying to use and capture stealth.

I think that some of the impacts of that—and I am really on page 8, numbered in the lower right-hand corner there—is to begin to point out that stealth cannot and should not be looked at as anything that is very mysterious. It is addressing itself to well-known physical principles and applying them.

I think if we can return to your thought of three generations, if we look at the F–117, what we were applying during that time period was the computational capability that we had, the control technology, flight control technology, et cetera, and that was really the first application of it.

As we moved then into the B–2 situation and we see simply the visual appearance of the application of stealth, from the faceted technology over, really, into the shaping of the vehicles, and again, perhaps, a generation or more of the application, not only for design, but actually for performance, in terms of our computational capability and much more in this case our materials capabilities, the technologies that we have supported over the years.

But one needs to be very careful. I hope we would remember that we have never said that a stealthy vehicle is either invisible or immortal. They live by all of the physical principles and, in fact, that has been a difficult communication for people to understand.

Stealthy aircraft will, in fact, be seen. They will be seen by visual means, they will be seen by electronic means. But it is one thing to see something. It is another thing to be able to act against it. So one has got to run through a chain of cumulative probabilities and we simply illustrate here that any successful air defense we go against has got to take that cumulative probability of success. And I think by adding stealth, we have essentially added another multiplier to that equation, and you continue to take the defense's probabilities, driving them back down toward zero.

You know, it is one thing—first you have got to have surveillance so you can detect. You have to turn that into tracking before you can do anything with the detection you had. You certainly, if you are going to do damage, have got to now have a guidance system. And finally, in order to, in fact, achieve a lethal situation, you have got to have fuzing.

Any break in that chain—and we address ourselves and would ask that people in thinking of this problem have to address themselves—to each item in that chain. I think that much of the discussion that has gone on in the area of low observables has simply missed the idea that we must run through this total sequence.

In the same way, I think there have been many very constructive challenges in phenomenology to the technology that is applied in stealth. Each one of those has been addressed and certainly they do have application. They may have application, in fact, at any point in this progression. But all together, we have still not found any Achilles heel to the application of stealth in any of the mission areas that we have addressed ourselves to.

In summary, really, on page 9, the real payoff on stealth we have to think about is stealth saves lives. We have proved again, I think, in Desert Storm that the most, not only flexible, but effective resource that we have available to us in the Air Force are the people. And as we can protect them and train them, that is going to be the highest return on investment.

So we summarize it by talking about lives.

We have a difficult problem as to what to protect in stealth, but stealth is here to stay. There is no turning back on that. Our position is we must stay ahead, again best illustrated, perhaps, by this hearing today, this idea that there are many aspects of this that are purely physical phenomena and can, and should be, shared on a broad, unclassified basis.

But as we have learned going along here, there are some things that should be protected, that do represent the key items of the lead that we believe we have here. Some of them are in the materials area, some of them are simply in the algorithms of design, some are in the manufacturing technology that we learned and, I think you pointed out earlier in your opening statement, we have paid a very dear price for.

The front end of this program has been quite expensive and we believe we have captured that now. Those things need to be protected. The rest should be shared. It should be shared not only because it gives a proper forum for people to discuss their effectiveness, but it also needs to be shared so that we, in fact, don't make the same mistake twice where we have had a learning opportunity, to do testing.

So we have had a program that was classified. Some of it is now unclassified, where we have been trying to share, certainly amongst the services, all of this for 10 years. So now I think that we are able to share it a little bit more broadly.

That places the opportunities to contribute to the technology in these areas on a broader base, into academia, into some of the different laboratories that can contribute. And we find, obviously, a better return if we can show people where we are pointed.

B–2 TESTING

You asked a little bit about testing. Testing on the B–2, I think many people believe, is going very slowly. I would tell you that the B–2 test program itself is set up different than other programs. The ability to have qualified the aircraft for in-flight refueling early lets us fly much longer flights. The instrumentation capabilities we have today, the data per minute of flight time, is dramatically improved from what we had.

We believe we have a very disciplined test program. We are, in fact, making our milestones. We have made available to you what we call a maturation matrix to show, on a yearly basis in all of the areas from installed subsystems to total aircraft performance and military capability, what we expect to achieve in each year, and the idea that we will not proceed and continue the investment in the program unless we can, in fact, show you that we have achieved those.

It is a long test program. The test program goes over a period of time out to, essentially, the end of 1995. I can assure you that it is phased in a proper manner such that we are learning those things early that are, in fact, the items that take the key risk out of the program.

The long time of running these programs out is because it is a very capable system. It is a system that needs to demonstrate its low-altitude and high-altitude flying. It needs to demonstrate its weapon delivery capability. It needs to demonstrate all the navigation modes.

But the latter parts of the program are, in fact, gathering data so that we know what to put in performance handbooks for the operators. The early part, much of which we have gone through right now, are the ones that tell us if we have, in fact, run into any show-stoppers or not.

I think we have now supplied to the committee and to other committees of the Congress the results of the first year of flight tests and, more importantly, Mr. Cheney, the Secretary of Defense, has delivered now the certification with respect to the first block of low observability testing, including the Defense Science Board review and including the operational test and evaluation review, and we are most encouraged by those results.

I think if low-observability testing is a test world all by itself, the instrumentation must, in fact, be evolved and designed as well as that which is going to be tested. I am here to say to you we are very pleased with our ability to not only do the type of engineering measurements that we need to do, but that they are of the instrumentation quality where we can not only know what the signature, as an example, of the aircraft is, but we have sufficient insight to know where we need to do tuning or any corrective action.

So the diagnostic element of instrumentation, which was a development during this time period, is available to us and those are complete. So we feel we have the tools of test as well as the equipment to test in place during this past year.

You point out, it is a very expensive program, and truly so. If we look on page 18, we are really at just over $30 billion of commitment to this program and we have simply tried to gather here a typical listing of things that have, in fact, produced results to date.

This is surely the most tested air vehicle before flight that I think we have ever been involved with, a right and proper caution, and I think it has proven to us that the results we are now measuring in flight as correlated to that which we would predict are very fine.

I use that as a descriptor really. That is as measured by instrumentation or, perhaps even more important, as reported by a fair number of flight tests, as well as operational test pilots who talk with respect to how they, in fact, can and will use the aircraft.

I think that we have seen the ability to go long distances and we think that is there and provable now. We can carry a very large payload. I think that, as compared to the F–117, which has certainly been an outstanding success, we are talking about five or six times the payload, over five or six times the range—a very powerful multiplication factor.

I think that everyone has their own return on investment calculations, if you will, but I think we will find that the B–2 will be the lowest cost per pound of weapon delivered anywhere in the world, and that is certainly a military capability that is being requested.

Sort of moving through here, there has been some questions with respect to the need. We have the B–52, we have the B–1, and we have the B–2 coming along. The B–52 is a very good aircraft. It has served us well in both the nuclear and the conventional role. The B–52 can be with us for a very, very long period of time.

The question with the B–52 that we are addressing, and you have asked us to put some reports together on this, is the cost of ownership of the B–52. As things get older—and perhaps we can all personally relate to this—the cost of upkeep goes up.

So we will be addressing that with you later this summer in a report that was requested to show how to relate the total cost of ownership of the B–52 now and as we go into the future and our reasons for wanting to, needing to continue to utilize the B–1 and to use the B–2 not only as an augment to the B–1, but in its own right.

I say those two ways because the B–2 is also necessary to permit us to get as much as we can out of the B–1, and we can return to that discussion if you wish later.

I think that it is necessary to restate again the mission. It has had a lot of discussion. Very frankly, the Air Force has been accused, if you will, of jumping from one mission to another with the B–2. I will tell you that the priority mission of the B–2 has never changed. It is nuclear deterrence and should be nuclear deterrence.

I will tell you further that, and we have showed in this document some of the words from the original early 1980's statement for an advanced strategic bomber that says there was to be a nuclear and a conventional capability from day one.

I would tell you that strategic relocatable targets never have been the primary mission of the B–2 and, in fact, never will be the primary mission of the B–2. We have simply said that when we get the invention—and the word is truly "invention"—that we know how to go after strategic relocatable targets, we find that the B–2 will very likely be the platform of choice to apply those subsystems and to address that mission.

The final thing I would say really gets into the mission area, and I think a message that we can see clearly that came out of Desert Storm is that an aircraft with stealth characteristics and that maintains those characteristics is able to operate independently, rather than having all of the packaging, et cetera, that goes forth, that we have seen, perhaps, in earlier wars.

I think it was best captured when the Secretary of Defense was saying that the F–117 was able and did, in fact, go to downtown Baghdad and did, in fact, operate with impunity, and that certainly has got to be a very strong step up with respect to our confidence in applying this technology to operational systems.

I think a few points that have been missed also in terms of successes of the F–117 program, are those things which very much drive our costs—maintenance man-hours per flight hour and others. We saw many new things when we introduced the F–117, but today we see with standard Air Force maintenance that that aircraft operates in terms of maintenance man-hours per flight hour, competitively with any of the other aircraft in our tactical inventory.

So we do have a learning process and we believe we do know how to operate them in the efficient and effective fashion while applying the technology at the same time.

Mr. Chairman, I would stop at that point and be open to questions. Hopefully, we have opened this field up to address those things which concern you.

[The joint statement follows:]

JOINT STATEMENT OF MR. WELCH AND GENERAL CROKER

Mr. Chairman and Members of the Committee: General Croker and I are pleased to appear before you today to provide an update on the B–2 program and discuss specific issues surrounding its acquisition.

In the investment accounts, we cannot afford to cut further the modernization programs for our three major systems. The B–2, Advanced Tactical Fighter, and C–17 are essential for very different mission areas. Our position on the B–2's importance in the defense budget has been further reinforced this past year by several significant international events, key Defense Department programmatic changes, and the successes of our test program.

The past year has again been one of remarkable events and changes in the global security environment. In Eastern Europe, the democratic movements forced the Communist Party from power in many countries of that region; however, along with the political changes came the reemergence of ethnic factions and strife which has created uncertainty and instability. The Soviet Union also allowed some democratic and economic reform; however, the process appears to have stalled with the country's future direction far from certain. In the Middle East, Iraq's decision to invade and claim Kuwait as an Iraqi province resulted in an unprecedented, multinational effort to liberate that country. These events all reminded us the world continues to be a very unstable place and will continue to be so for the foreseeable future.

While all of these events are important, certainly the one that most captured the world's attention since last August was the U.S.-led effort to expel Iraq from Kuwait. Operation Desert Storm proved to be an example of a "textbook" operation that will be studied for years to come by many historians. Although it is still too early to fully understand all the lessons learned in this conflict, it is evident that the effectiveness of our high technology weapons was clearly demonstrated. The warfighting advantages of these advanced systems more than justified the last decade of investment. Thousands of returning veterans—who might not have returned otherwise—will attest to that fact.

One of the most important high technology success stories was the value of stealth in combat. The F–117A was able to operate successfully in the most heavily defended areas "with impunity." It handled the toughest targets, night after night with absolute precision. Because it eliminated the need for large numbers of support aircraft for escort and suppression of enemy air defenses, and saved lives on both sides, it showed how stealth, including its cost, is a bargain. The bottomline is: stealth provides more combat capability from a smaller number of assets and reduces risk to our personnel.

The B–2 represents a new generation of stealth capability in a long-range, heavy payload, highly survivable bomber. The first generation of stealth aircraft was the SR–71, next the F–117 and then the B–2 with even better capabilities. The B–2 has the potential to deliver approximately 5 to 6 times the payload of the F–117 at 5 to 6 times the range. When compared to the F–117 in terms of cost to deliver a pound of payload, the B–2 represents a better value—even without considering range advantages. With this next generation of stealth we will buy about ten times the ton miles of munitions per dollar with the B–2 as we get with the F–117.

There have been a lot of stories about the B–2. The majority of these concentrate on the B–2 mission in areas such as conventional capabilities, precision guided munitions, or its role as a relocatable target hunter. Critics have argued that the Air Force continues to change the mission of the B–2. This is not the case. The original B–2 mission statement in the B–2 Weapon System Specification, dated 1 November 1981, stated that "the Advanced Strategic Penetrating Aircraft (ASPA) shall provide the capability to conduct missions across the spectrum of conflict, including general nuclear war, conventional conflict, and peacetime/crisis situations." The 31 December 1990 mission statement from the Selected Acquisition Report stated "The B–2 will have the capability to perform nuclear delivery and world wide conventional response missions consistent with Strategic Air Command (SAC) requirements." During the period of the Cold War, the Air Force admittedly placed greater emphasis on the nuclear role of the aircraft. However, we have always realized the inherent flexibility of long range bombers offers a wide variety of operational mission options across the entire spectrum of conflict. Reduced United States-Soviet tensions and the current volatile Middle East situation have resulted in increasing emphasis on the B–2's conventional role. The baseline B–2 has always had the capability to deliver both conventional general-purpose bombs and/or precision weapons. Instead of changing its mission, the B–2 in fact is showing that it has the flexibility for the changing requirements of modem warfare.

"Mission" is a general term that can be used to refer to everything from the broad goals of deterrence, to more narrow operational goals, like attacking certain targets. Consequently, the ambiguity in this term has led to much confusion surrounding the mission of the B–2. The Air Force has consistently referred to the B–2's mission in the broader sense of deterrence. The B–2 mission is the same today as it was in the mission statement of 1981. Attacking highly mobile targets is neither the reason for the B–2, nor is it likely to be accomplished with great efficiency in the near to mid-term future. However, we continue to believe the B–2 is the best longer term hope for that job consistent with relocatable target detection technology development.

The Air Force has not just discovered the advantages of the B–2 in a conventional scenario. Recent increased emphasis and discussion of this role represents our increased confidence in stealth (via F–117 results), and recognition of the critical need for responsiveness, especially in the first days of a crisis. The B–2's range and payload advantages will continue to become more critical in the future as our force structure and overseas operating locations continue to be reduced. From 1990 to 1995, DOD will make several force structure reductions that will substantially impact U.S. power projection capabilities. Strategic heavy bombers will be reduced from 268 down to 181. With deployment of the Advanced Tactical Fighter (ATF) delayed until after the year 2000, the B–2 is the only stealthy aircraft that will be deployed in this decade. We will reduce Air Force tactical fighter wings from 36 to 26, and some of these reductions will occur in forward deployment bases. To date, the Air Force has announced withdrawals from 25 overseas locations.

Long range B–2s will offer the potential to offset some of these reductions. Bombers provide unparalleled flexibility for our decision-makers during crises, and stealthy B–2s will offer new dimensions to U.S. global reach and global power. Bombers possess the unique ability to provide rapid response, from a show of force to actual weapon delivery, to any location on the globe within hours with minimal support. In addition to this ability to deploy quickly, they can concentrate force with speed and surprise and provide a wide array of lethal and non-lethal actions. This ability to influence a conflict early and maintain that influence can be instrumental in controlling escalation at the lowest possible level. The importance of heavy bomber firepower was demonstrated in Operation Desert Storm when additional B–52s were requested by the on-scene commander. B–2s will provide a greater range and payload combination than B–52s and B–1Bs and stealthier operations than F–117s.

The war in the Middle East was also a vivid reminder that proliferation of advanced weapons will pose serious threats to U.S. forces in the future. Iraq's SCUD missiles, threat of chemical weapons and the near-term potential for nuclear weapons all reminded us that advanced technologies and weaponry continue to be exported to developing nations around the globe. At least 20 countries can produce chemical weapons, and by the turn of the century, 15 nations could have ballistic missiles. Earlier this year, a magazine article quoted a Soviet official as announcing the Soviets would offer their most advanced fighter—the MIG–31—for sale to "friendly countries." Exporting such air defense systems is one of the key means by which the Soviets can obtain hard currency to rebuild their economy and is therefore expected to continue. Advanced weapons and air defenses can turn many third world nations into first world threats. Such probable scenarios make it more imperative that our smaller forces of the future be the most survivable we can field.

While the Cold War has ended, we must also remember that, for the foreseeable future, the Soviet Union will continue to possess the capability to destroy the United States in 30 minutes. After initial promising progress toward political and economic reform, the situation in the Soviet Union left more questions than answers. The Soviet Union continues to modernize and improve the effectiveness of their strategic nuclear arsenal, and by the turn of the century, it is expected they will have completely modernized their Triad. while arms control negotiations hold the promise for reductions in the number of deployed nuclear weapons, currently agreed to limits demand no lessening of the elements of deterrence. These agreed to limits will still allow the Soviets to prosecute their military objectives.

As the cornerstone of the bomber leg, the B–2 will be critical to maintaining a viable, balanced Triad well into the 21st century. As the most flexible element of the Triad, bombers provide unique capabilities which ICBMs and SLBMs cannot. Because they are recallable and do not present the threat of a preemptive first strike, they are considered the most stabilizing strategic system. In addition, man-in-the-loop flexibility makes bombers the only system that can be used before deterrence fails to demonstrate resolve by increasing ground readiness postures or launching under positive control. Both sides have recognized these stabilizing advantages of bombers and have accorded favorable START counting rules to incentivize bomber deployment. It should also be stressed that, while the Soviets continue to modernize, if the B–2 is canceled, the U.S. will have stopped a major element of its strategic modernization program, other portions of which have already been scaled back.

The first B–52 was rolled out 37 years ago, and it has proven to be a very capable and adaptable weapon system. It was initially fielded as a high altitude, long range bomber whose primary purpose was to deter a nuclear war with the Soviet Union. However, during the Vietnam and recent Middle East conflicts, the B–52 proved that it could also be a valuable asset in conventional scenarios. The B–52 flew only 5 percent of the total Vietnam sorties, but delivered 50 percent of the total tonnage dropped and was decisive in bringing the North Vietnamese to the negotiations table. In Operation Desert Storm, B–52s dropped 30 percent of total tonnage against a wide variety of targets and were instrumental in breaking the combat capability of deployed troops and destroying critical war supporting supplies. While the B–52 remains a very capable weapon system today, its technology is old and service life expensive. Just as continuing modifications enabled the B–52 to remain viable and flexible for over 30 years, the substantial growth potential designed into the B–2 will enable it to adapt to evolving missions and threats throughout its estimated 40 year life cycle.

In addition to changes in the worldwide security environment, the on-going successes of the B–2 test program have strengthened our confidence the B–2 is the right system for our future, smaller force structure. The B–2 flight test program began in July 1989. Over the past year it continued to prove the B–2 will be capable of performing as expected. The second B–2 was first flown in October 1990. To date, the two aircraft have flown a total of 170.6 hours during 44 sorties. AV–1 was instrumental in clearing the initial flight envelope and performing the initial low observables tests. AV–2 resumed the envelope expansion and flutter work started by AV–1. The B–2 is continuing to successfully complete milestones consistent with it's System Maturity Matrix in areas such as mission performance, low observables, air vehicle performance, integrated logistics support, and mission planning systems. Some of the major performance parameters we have demonstrated include the following: Handling qualities equal to or better than the simulator; excellent correlation with engineering predictions; maximum altitude of above 40,000 feet and maximum speed of more than 400 knots; and aerial refueling qualified with both the KC–10 and KC–135R.

There have been several independent reviews of the B–2 test program. The Office of the Secretary of Defense, Director Operational Test and Evaluation stated, "From the data we have assessed, there does not appear to be any significant aerodynamic or air worthiness hurdles that would conflict with the operational expectations of the B–2" and "The ease of performing B–2 air refueling is a testimony to its excellent flying qualities." The Office of the Secretary of Defense, Director Defense Research and Engineering observed, "In general, the B–2 has performed equal to or better than predicted in the areas of performance and flying qualities." Additionally, the Defense Science Board states, "* * * from the results of testing that we have seen, we note no technical or performance problems that would lead us to challenge range and payload performance expectations for the B–2. Nor have we observed any flight worthiness or aerodynamic problems that give us cause for program caution." The Defense Science Board (DSB) found no major problems during initial low observables test flights that would prevent the B–2 from satisfying its operational requirements. The General Accounting Office is currently completing their Congressionally directed review of this same series of testing.

The B–2 program has also provided many manufacturing accomplishments. The B–2 program pioneered the total integration of computer aided design, engineering, manufacturing, logistic support, business integration and product data exchange technology. The B–2 industrial team has also developed nearly 900 new materials and manufacturing processes. Some specific achievements include the development of computer controlled drills and a high-speed milling machine that reduce processing time and increase quality and computer software developed to control application of composite tape to large, contoured components. These composite materials result in a 25% to 50% savings in airframe weights. The Technology Administration, U. S. Department of Commerce, puts the year 2000 advanced materials market at approximately $150 Billion annually, and the B–2 composite technology is the foundation for this market. The B–2 research and development investments are a national asset and the foundation of 21st century aviation industry competitiveness.

The B–2 program has, within the last year, undergone a major revision based on the Secretary of Defense's B–2 Major Aircraft Review (MAR) decision for a 75 aircraft procurement program. As a result, the Air Force has adopted a "5x2" buy profile in which 2 aircraft are procured each year between FY87 and FY91. This profile is a product of repeated reductions in numbers of aircraft funded each year subsequent to FY87 and FY88. These reductions have meant that each of the funded aircraft remaining have had to absorb a larger slice of the overhead and other fixed contractor costs necessary to field the first aircraft. The FY91 funds are currently being used to fund the remaining two low rate initial production aircraft. Late last year the Air Force also restructured the buy profile for RDT&E and procurement funding at approximately $5.0 billion per year. This was done to keep the program within the Air Force's Total Obligation Authority (TOA) while still maintaining production efficiency. The B–2 program is a very small share of the total Department of Defense (DOD) budget. The B–1B, B–52, B–47, and B–36 all have had larger peak funding years as a percentage of the DOD budget. Currently, the B–2 FY92 funding request represents only two percent of the total DOD budget—a yearly obligation authority just under half that experienced by the B–1B in its peak year. The total cost of the revised B–2 program is now $64.8 billion (TY$), including military construction. FY92 marks the last big RDT&E year for B–2. The FY92 request of $4.8 billion supports the buy of four additional production aircraft beyond the ten currently authorized. These four aircraft are required to maintain production efficiency and to build toward providing the Air Force a B–2 operational capability.

Fiscal constraints forced the Air Force to sacrifice force size while continuing modernization and preserving readiness—to provide a smaller, but balanced, ready, and sustainable force. The stealthy B–2 will become the centerpiece of this smaller, smarter and better force—providing the stabilizing, deterring, and flexible capabilities of bombers for the long term.

Senator INOUYE. Does General Croker want to say anything?

General CROKER. No, sir; I have no comment.

Senator INOUYE. Senator Stevens, do you want to say something first.

Senator STEVENS. No; I am sorry I was late. I was at another meeting, Mr. Chairman. I have no opening statement.

Senator INOUYE. Mr. Secretary, thank you very much for your statement.

I think it is very important that we do everything possible within the rules governing classification to make all the facts, all possible facts about the B–2, known to the public. Because of the requirement of classification, up until now all focus has been upon cost alone, and I am glad that we are now touching upon the merits of the aircraft and the effectiveness of the aircraft.

In Operation Desert Storm, one of the most dramatic performances was that carried out by the F–117, as you noted. Initial reports of the first 24 hours of Baghdad bombing suggested that 40 percent of the targets for that first 24 hours were destroyed by less than 3 percent of the aircraft that participated in the bombardment and the 3 percent was made up of the F–117's.

COST COMPARISON B–2/F–117

In your statement you have suggested that the B–2 is much more cost effective than the F–117. I would like you to elaborate further on this. You have touched upon it, but you have said, for example, that it has a distance of more than five times that of a F–117 and in this case, as a result, it would not require a tanker fleet. It has a capacity of carrying a payload maybe six times that of the F–117. But can you go beyond that?

Mr. WELCH. Sir, I think first we would need to establish the base that we are speaking from. If we were to duplicate the F–117 today, in other words simply move the program from when it was developed and start today to develop it, we would find that the program unit cost, simply the total cost of the program divided by the number of aircraft purchased, that aircraft would run about $144 million per aircraft in fiscal year 1992 dollars. So we need to make sure we are getting the proper fiscal sense.

By proper basing, the B–2 can reach any target in the world and return with one refueling. So you have got to look at the cost of the supporting bomber fleet.

Then simply doing the multiplication in terms of pounds of ordnance available to be delivered, if you want to measure it in ordnance per mile per dollar, you will find out that the multiplication will rule and we will come up with the B–2 as being the most effective way to deliver the required ordnance.

I think also that provides insight into the question we are asked many times: Will you use the B–2 to do that? I see the world from a different perspective than our operational commanders. Operational commanders have always recommended to go and do the job the most effective way, whether it be a dollar standpoint or lives saved or responsiveness, et cetera. So I think whichever measure you wish to put into there, the B–2 will, in fact, show that it has a very powerful leverage.

General Croker may wish to add to that.

General **Croker**. As I understand your question, Mr. Chairman, you wanted some indication or measure of cost effectiveness and I would like to portray that in three ways. And if you will permit me again to use the charts that Mr. Welch gave you. On page 32, it gives you some example of what we experienced in Desert Shield, and I think with the aid of the drawing and a few comments it might help to make the point.

There are three packages represented there——

Senator **Inouye**. Before we proceed, without objection all of these charts will be made part of the record.

[The charts follow:]

DEPARTMENT OF THE AIR FORCE
PRESENTATION TO THE
SAC SUBCOMMITTEE ON DEFENSE
ON THE
B-2 STEALTH BOMBER

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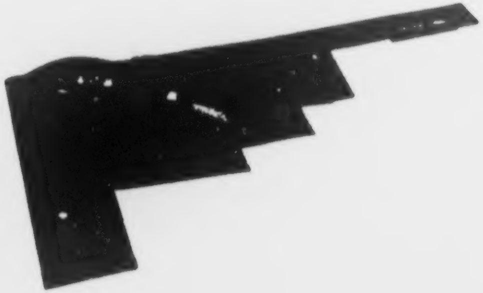
11 APRIL 1991



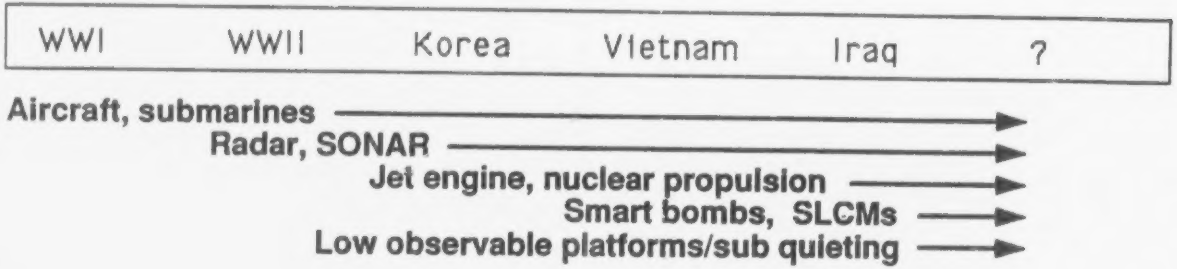
Overview

B-2 Stealth Bomber

- Impacts of Stealth Technology
- Test Performance
- Cost and Affordability
- B-2 Mission

Impact of Technology on Surprise

B-2 Stealth Bomber


WWI WWII Korea Vietnam Iraq ?

Aircraft, submarines →

Radar, SONAR →

Jet engine, nuclear propulsion →

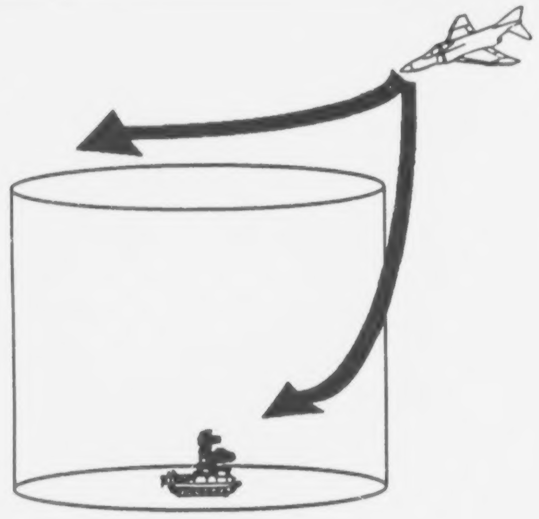
Smart bombs, SLCMs →

Low observable platforms/sub quieting →

- Initially, aircraft and submarines enjoyed the benefit of surprise
- Radar, SONAR, and new propulsion techniques changed warfare
- Low observables restored the element of surprise for airplanes
- Surprise is not a birthright. Other countries are working hard to catch up. Therefore, we must capitalize on our significant investment in low observability to ensure a lasting U.S. advantage.

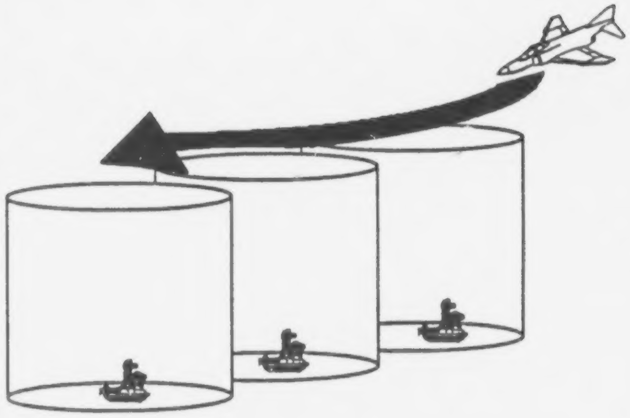
Threat Engagement and Avoidance

B-2 Stealth Bomber



One-on-One Engagement:

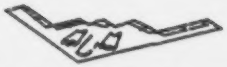
Against a single threat, stay away or go around.



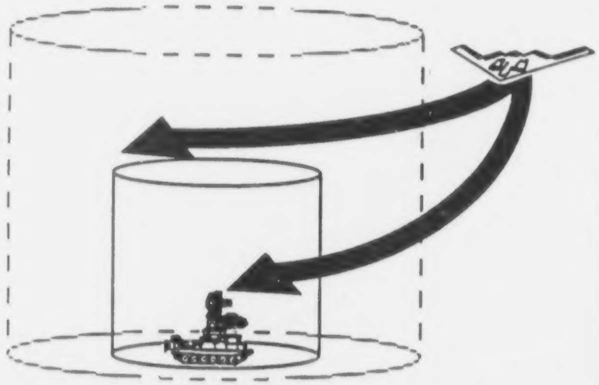
One-on-Many Engagement:

Against a "fenceline" of threats, stay away, or penetrate and lose surprise.

Low Observables Shrink The Threat

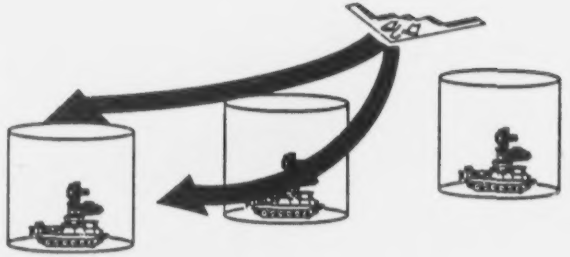


B-2 Stealth Bomber



One-on-One Engagement:

Low observable airplanes regain surprise and have more maneuvering room.



One-on-Many Engagement:

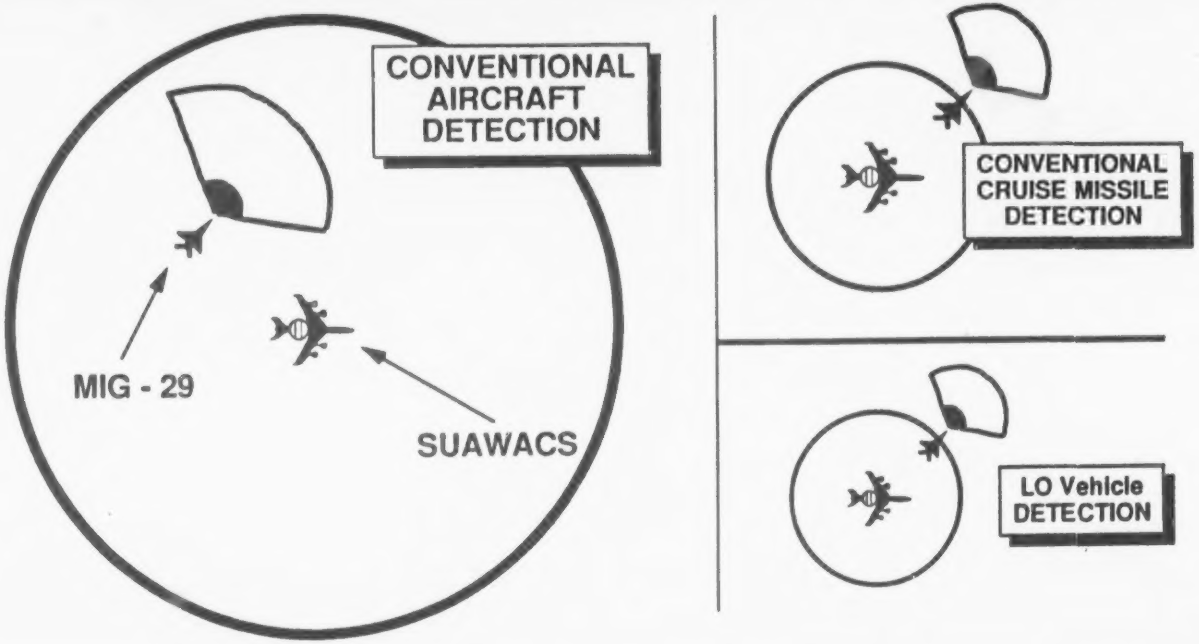
Gaps in the defensive fence greatly increase offensive flexibility.

STEALTH = ADVANTAGE OFFENSE

Stealth Effectiveness

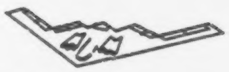
B-2 Stealth Bomber

When compared to conventional targets, stealth greatly decreases the effectiveness of operational radar systems (e.g.: SUAWACS, MIG - 29).

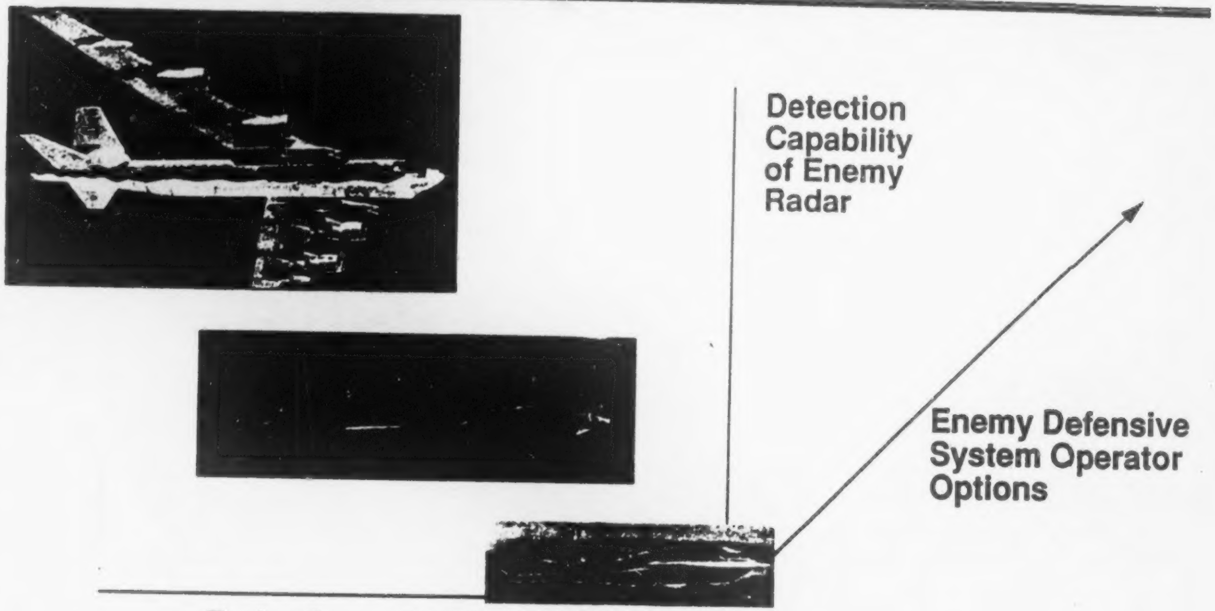


CONVENTIONAL AIRCRAFT DETECTION
MIG - 29
SUAWACS
CONVENTIONAL CRUISE MISSILE DETECTION
LO Vehicle DETECTION

Detection Capability and Relative Size



B-2 Stealth Bomber



Detection Capability of Enemy Radar

Enemy Defensive System Operator Options

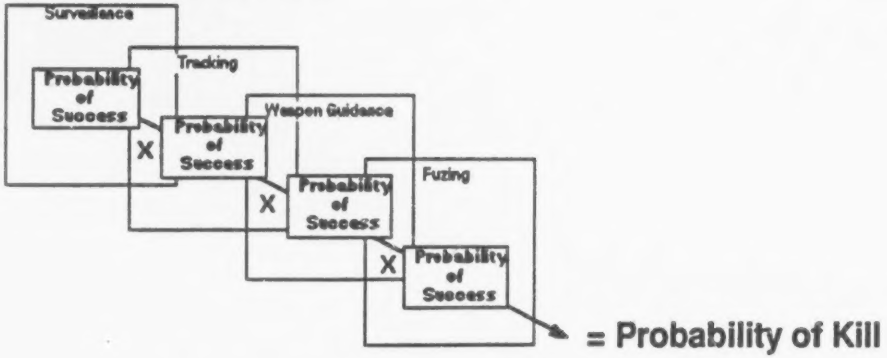
Radar Cross Section (RCS)

STEALTHY AIRPLANES REDUCE DETECTION RANGE AND LIMIT OPERATOR EFFECTIVENESS

Stealth and Survivability

B-2 Stealth Bomber

- LOW OBSERVABLE PLATFORMS, NOW COMBAT PROVEN, HAVE DRAMATICALLY CHANGED THE BATTLEFIELD – THEY CRIPPLE THE ENEMY'S EFFORTS TO DETECT, IDENTIFY, ENGAGE, AND DESTROY OUR FORCES
  - ENEMY'S RETURN ON INVESTMENT IN AIR DEFENSES IS DENIED
- **RESTORE THE ELEMENT OF SURPRISE**
  - U.S. CHOOSES THE TIME AND PLACE OF ATTACK
  - ENEMY CANNOT REACT EFFECTIVELY


Surveillance
Probability of Success
X
Tracking
Probability of Success
X
Weapon Guidance
Probability of Success
X
Fuzing
Probability of Success
= Probability of Kill

SUCCESSFUL AIR DEFENSE IS A PROBLEM IN MULTIPLICATION:

The B-2 drives the product towards zero.

STEALTH PAYOFF HIGH

B-2 Stealth Bomber

Stealthy aircraft can penetrate with fewer support assets and preserve surprise

- less risk to crew members

Stealthy aircraft permit more rapid suppression of ground-based air defenses

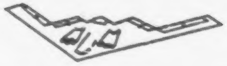
- less risk to our ground forces personnel

Stealth may permit more accurate delivery of munitions

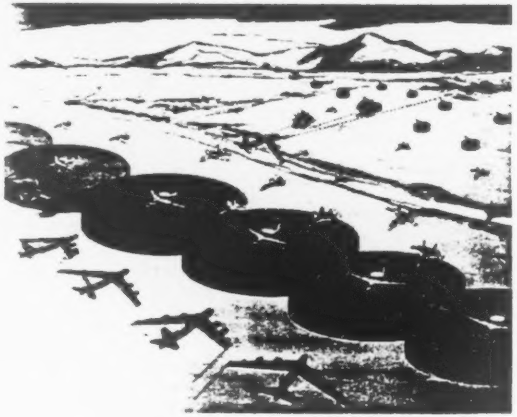
- less risk to non-combatant personnel from collateral damage

Stealth Saves Lives

Stealth Is Here To Stay

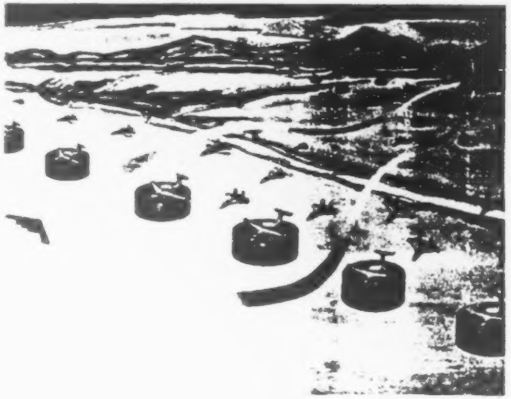


B-2 Stealth Bomber



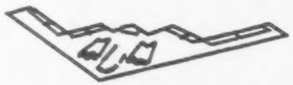
- LO platforms will change the strategic landscape
  - Employment concepts
  - Logistics tail
  - Deterrent equation
  - Force size
- Significant U.S. investment is already producing results

- We can't turn back; stealth technology has reshaped the battlefield
- We have invested much to counter stealth but...
  - The more we spend -- the more we are convinced stealth works



STEALTH HAS CHANGED THE BATTLEFIELD

Overview

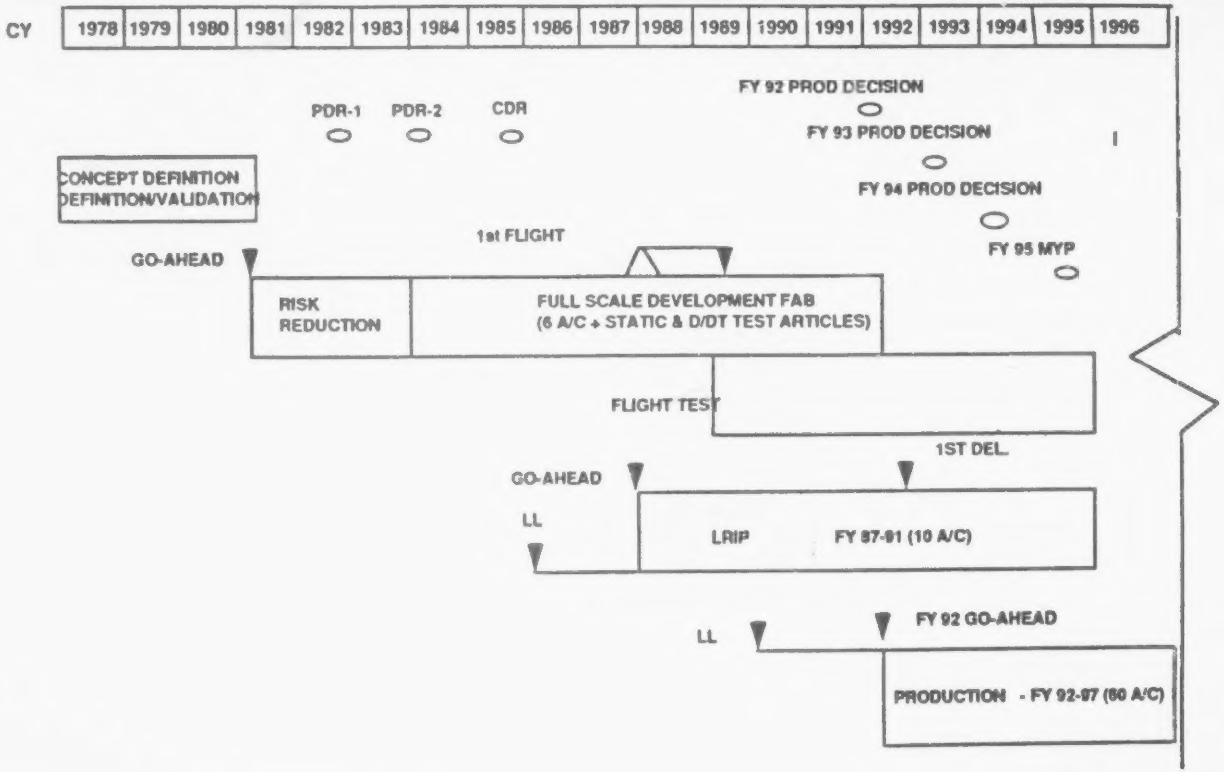


B-2 Stealth Bomber

- Impacts of Stealth Technology
- Test Performance
- Cost and Affordability
- B-2 Mission

B-2 Program Schedule

B-2 Stealth Bomber



B-2: Risk Management Summary

B-2 Stealth Bomber

- Ten years of risk closure behind us
- Most extensive computer aided design and simulations in history of aircraft development
- Extensive development testing
  - 24,000 hr wind tunnel
  - 44,000 hr avionics test and evaluation
    - Avionics test bed flying since November 1986
  - 6,000 hr flight control test and evaluation
  - 30,000 test hrs / 100,000 radar patterns

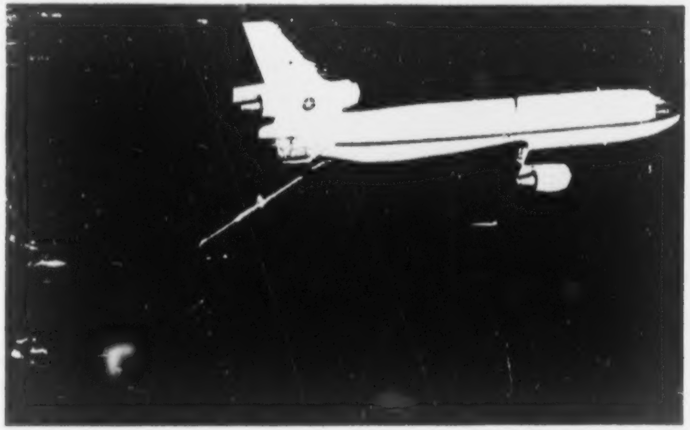
- **Over 168,000 structure specimens tested**
  - Completed first lifetime of durability testing on full-scale airframe
  - Full-scale static testing progressing well
    - In all cases, structure has sustained ultimate load without failure

Early, Extensive Risk Reduction Gives High Confidence In Product Integrity

B-2 Flight Test Status

B-2 Stealth Bomber

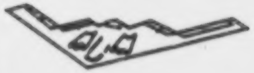
- **As of 5 Apr 91**
  177.1 hrs flying time
- **45 flights to date**
- **Max speed**
  - Approx 400 knots
    at 5,000 feet
- **Max Altitude**
  - 45,000 feet



- **Initial envelope flight worthiness validates**
  - Aircraft systems performed as expected
  - Handling qualities excellent
  - No ground effect issues
  - Preliminary performance matches predictions
  - Refueling complete with both KC-10 & KC-135
- **Initial LO testing successfully completed**

Excellent Early Aircraft Reliability / Maturity Demonstrated

Low Observable Testing



B-2 Stealth Bomber

- **Signature reduction takes many forms**
  - radar cross section
  - infrared
  - visual
  - emissions
  - acoustic

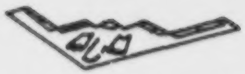
- **Most B-2 early testing concentrates on radar signature**

- **Early testing is performed against high resolution instrumentation radars vice operational radars**
  - allows precise assessment of signature
  - accelerates problem resolution
  - technical understanding

- **Once the vehicle radar signature is validated, testing against operational radars is accomplished.**
  - allows assessment of man-in-the-loop effects
  - testing performed against a range of threats
  - operational understanding

- **Throughout the development, trades are made between low observable performance and changes in employment tactics.**

Defense Science Board and OSD/DOT&E Reports



B-2 Stealth Bomber

Block I Testing: Initial Performance Testing

"...from the data available, nothing we have seen would conflict with the expectations that the B-2 should provide a significant capability in range and payload performance and will essentially negate the large investments the Soviets have made in air defense."

Defense Science Board, 20 Jan 1990

"...In general, the B-2 has performed equal to or better than predicted in the areas of performance and flying qualities."

OSD/DOT&E, 11 Jun 1990

Block II Testing: Initial Low Observable Testing

"Based on flight test results to date, there are no indications that basic B-2 aircraft survivability is in jeopardy."

OSD/DOT&E, 25 Feb 1991

"...we found no substantive signature surprises. Based on our review of the test results, we see nothing that would lead us to believe that the B-2 will not be the highly survivable aircraft intended at the start of this important program."

Defense Science Board, 20 Feb 1991

Overview

B-2 Stealth Bomber

- Impacts of Stealth Technology
- Test Performance
- Cost and Affordability
- B-2 Mission

B-2 Achievements to Date

B-2 Stealth Bomber

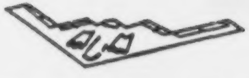
$30.8B COMMITMENT RESULTS IN:

- NEXT GENERATION STEALTH DEVELOPMENT
- FLY-BY-WIRE FLIGHT SOFTWARE
- PRODUCTION CAPABILITY & TOOLING
- INITIAL BASE FACILITIES
- FLYING WING DESIGN IDEAL FOR LONG RANGE, HIGH PAYLOAD

- FLIGHT TEST PROGRAM: - 24,000 HOURS WIND TUNNEL TESTING
  - 44,000 HOURS AVIONICS TESTING
  - 6,000 HOURS FLIGHT CONTROL TESTING
  - 177.1 HOURS AV-1 AND AV-2 FLYING TIME (AS OF 5 APR 91)

16 AIRCRAFT (IN PROCESS): - SIX FLYING TEST AIRCRAFT
- TWO GROUND TEST ARTICLES
- TEN OPERATIONAL AIRCRAFT

Cost Effective Force Multiplier



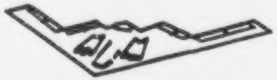
B-2 Stealth Bomber

- THE VALUE OF A B-2 WILL BE ITS ENDURING CONTRIBUTION TO NATIONAL SECURITY FOR MANY YEARS
- THE B-2 LEVERAGES OUR UP-FRONT INVESTMENT IN STEALTH TECHNOLOGY
- IN AN AUSTERE BUDGET ENVIRONMENT, THE B-2 WILL BE THE CENTERPIECE OF A SMALLER, MORE CAPABLE FORCE

Commitment to date	With Termination Cost	Additional Cost to go
$30.8B	$36.4B	$28.4B

> "WE HAVE INVESTED A HUGE AMOUNT IN THE B-2 ALREADY. WE ARE AT THE STAGE NOW WHERE WE CAN BEGIN TO REAP THE BENEFITS OF THAT INVESTMENT AND WE WANT TO GO FORWARD WITH THE 75 PLANES."
>
> SECRETARY OF DEFENSE

High Value Investment



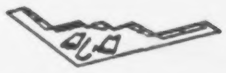
B-2 Stealth Bomber

- THE B-2 PROGRAM IS A VERY SMALL SHARE OF THE TOTAL DoD BUDGET

PEAK FUNDING YEARS

	1	2	3	4	5	6	7	8	9
B-36	1949 2.3	1.4	1.4	0.7					
B-47	1.5	1951 3.2	3.2	2.0					
B-52	0.7	1.1	0.4	1.2	2.0	1957 3.0	1.6	0.6	1.2
B-1B	1.0	2.0	2.6	1985 2.7	1.8				
B-2	1.4	1992 2.0	1.8	1.7	1.4	1.2	0.9		

B-2 R&D Spinoffs



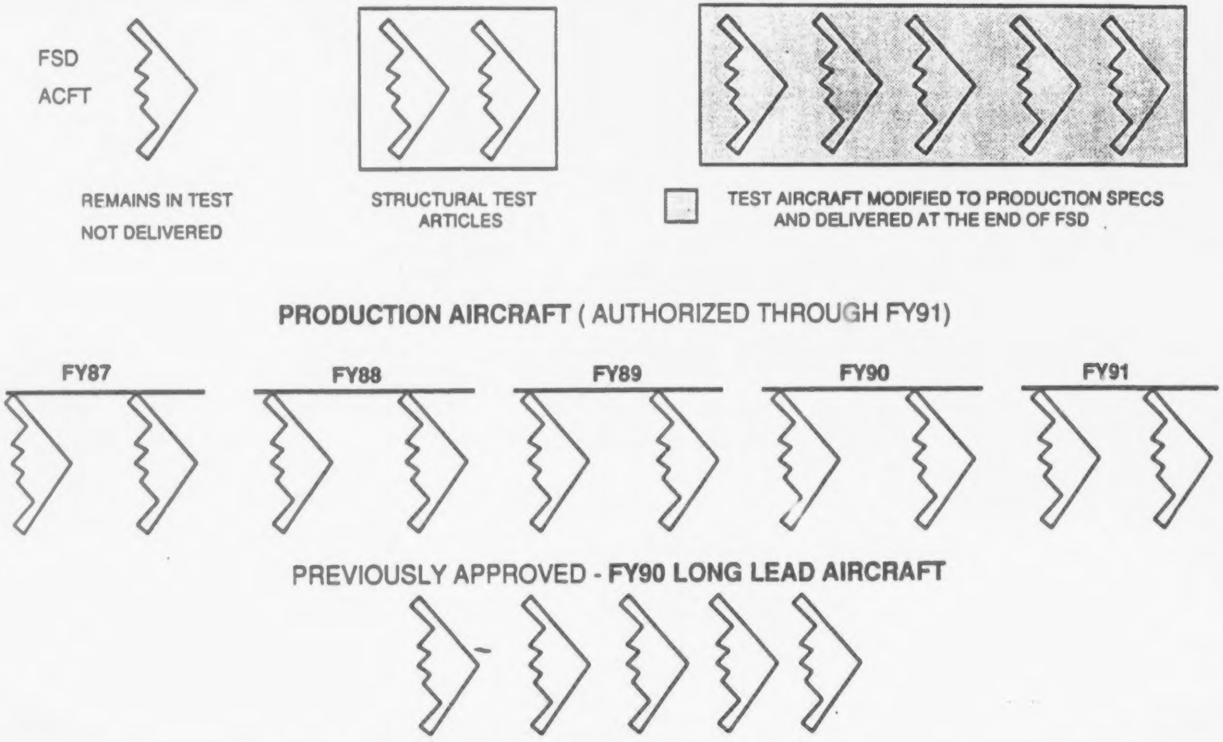
B-2 Stealth Bomber

TECHNOLOGY	B-2 DEVELOPMENT	SPINOFF APPLICATION
Stealth	Radar absorbing and composite materials, sensors	Future combat vehicles
Aerodynamics	Flying wing design and advanced fly-by-wire flight controls	Designs requiring maximum range/payload and high maneuverability
Propulsion	Embedded engine inlet/exhaust	Future military/commercial aircraft
Design/Development	First-ever national-level 3D database	Large/complex design efforts
Reliability/Maintainability	High reliability materials, computer based maintenance and repair capabilities	Systems requiring continuing maintenance
Manufacturing	Advanced materials processing	Aerospace, automotive, and construction industry
Structural Materials	Large, strong light weight metal/composite structures	Low cost, light weight structural materials
Electronic Data Fusion	Totally integrated cockpit	Future military/commercial aircraft and space systems

B-2 DEVELOPMENT WILL YIELD SPINOFF BENEFITS TO U.S. INDUSTRIAL BASE FOR MANY YEARS

B-2 FY 91 PB

B-2 Stealth Bomber



TEST AIRCRAFT

FSD
ACFT

REMAINS IN TEST
NOT DELIVERED

STRUCTURAL TEST
ARTICLES

▨ TEST AIRCRAFT MODIFIED TO PRODUCTION SPECS
AND DELIVERED AT THE END OF FSD

PRODUCTION AIRCRAFT (AUTHORIZED THROUGH FY91)

PREVIOUSLY APPROVED - **FY90 LONG LEAD AIRCRAFT**

B-2 FLYAWAY COST

B-2 Stealth Bomber

ASSUMPTIONS:

- ASSUMES AN ON-GOING PROGRAM BASED ON FY92 PRESIDENT'S BUDGET
- INCLUDES THE COST TO REFURBISH FSD AIRCRAFT
- BASED ON RECURRING FLYAWAY - INCLUDES AIRFRAME, ENGINEERING AVIONICS, ENGINES, WEAPONS DELIVERY EQUIPMENT, ECO, AND P3I

75 A/C VS 15 A/C PROGRAM COST COMPARISON (TY$ IN MILLIONS):

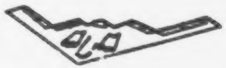
75 AIRCRAFT PROGRAM

	RECURRING FLYAWAY UNIT COST	PROG ACQ COST
1 ST 15 A/C	$775.9 M	$33,944.5M
LAST 60 A/C	$414.2M	$30,743.3M
LAST AIRCRAFT	$339.9M	N/A

15 AIRCRAFT PROGRAM

RECURRING FLYAWAY UNIT COST	PROG ACQ COST
$891.5M	$36435M

Bomber Inventory Outlook

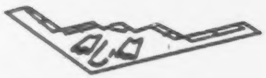


B-2 Stealth Bomber

- B-52 has served the United States well — but service life limited and technology old
- B-1B limited in number – purchased to bridge gap between B-52 and B-2
- By 1993, force deteriorates to approximately 200 bombers – half of which will be over 30 years old
- By 2010:
  - B-52G Retired
  - B-52H 50+ years
  - B-1B 23+ years
- By comparison, the average age of the aircraft in the commercial airline fleet is 15 years

NEW PLANE IS ESSENTIAL TO CONTINUED VIABILITY OF BOMBER FORCE

Overview



B-2 Stealth Bomber

- Impacts of Stealth Technology
- Test Performance
- Cost and Affordability
- B-2 Mission

Nuclear Deterrence

Our Number One Priority

B-2 Stealth Bomber

- DETERRENCE HAS PROVIDED THE FOUNDATION FOR U.S. MILITARY STRATEGY FOR OVER 40 YEARS

- SOVIET UNION REMAINS THE ONLY NATION THAT CAN DESTROY THE U.S. – WITHIN 30 MINUTES
  - THE POTENTIAL FOR NUCLEAR EXCHANGE IS AT ITS LOWEST POINT IN 40 YEARS, HOWEVER...
    - THE CONSEQUENCES OF FAILURE TO DETER ARE UNACCEPTABLE
  - SOVIETS CONTINUE MODERNIZING THEIR OFFENSIVE AND DEFENSIVE FORCES

- THE TRIAD IS A TIME-PROVEN HEDGE AGAINST SOVIET TECHNOLOGICAL BREAKTHROUGHS AND U.S. SYSTEM FAILURES

OUR REDUNDANT FORCES ARE A HIGH-VALUE INSURANCE POLICY

EXTRACTS FROM THE ORIGINAL B-2 MISSION STATEMENT

B-2 Stealth Bomber

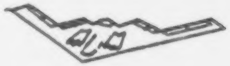
- "GENERAL DESCRIPTION: THE ADVANCED STRATEGIC PENETRATING AIRCRAFT (ASPA) SHALL BE A MANNED STRATEGIC PENETRATING AIRCRAFT THAT ENABLES THE UNITED STATES TO PROVIDE A RAPID, WORLDWIDE MILITARY FORCE PROJECTION WITH ON-SCENE HUMAN JUDGEMENT AND IMMUNITY TO DEFENSIVE ACTIONS."

- "THE ASPA SHALL PROVIDE A CAPABILITY ACROSS A TOTAL RANGE OF INTERNATIONAL CONFRONTATIONS AND BE EFFECTIVE IN BOTH NUCLEAR AND CONVENTIONAL WEAPONS DELIVERY MISSIONS."

- 'MISSION: THE ASPA SHALL PROVIDE THE CAPABILITY TO CONDUCT MISSIONS ACROSS THE SPECTRUM OF CONFLICT, INCLUDING GENERAL NUCLEAR WAR AND THE POST-SINGLE INTEGRATED OPERATIONS PLAN (SIOP) PERIOD, CONVENTIONAL CONFLICT, AND PEACETIME/CRISIS SITUATIONS."

IN 1981 THE B-2 WAS KNOWN AS THE ASPA. THE NAME HAS CHANGED, BUT THE MISSION REMAINS THE SAME

Lowest Nuclear Threat in 40 Years?



B-2 Stealth Bomber

- Enormous uncertainty about developments inside Soviet Union in the future

- Greatest threat may come from Soviet inability to control events inside Soviet Union
  - Soviet military insisting upon retaining an excessive claim to Soviet resources
  - We are unable to come to closure on a Strategic Arms Agreement or conventional forces in Europe agreement

- Soviets retain significant strategic capability
  - Continuously improving, modernizing threat to the United States

- Soviets continue to modernize their surface to air missiles and fighters
  - Export much of it to third world countries

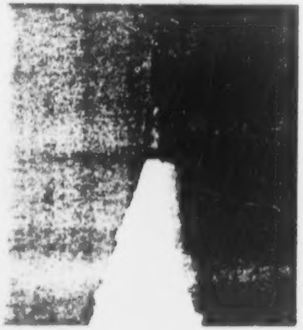
Only Nation Capable of Destroying
United States

The Balanced Triad

B-2 Stealth Bomber

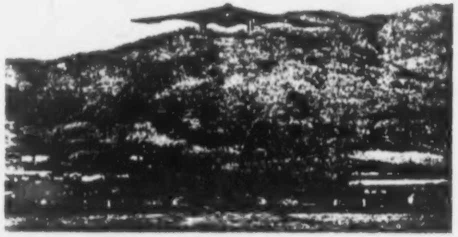
STRATEGIC TRIAD

ICBMs



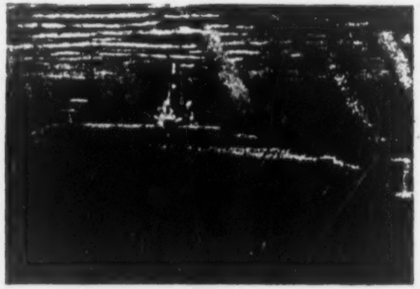
- Use when deterrence fails
- Low O&S cost
- High day-to-day alert
- Immediate response
- No recall
- No recycle
- No conventional use

BOMBERS



- Demonstrates resolve in crisis before deterrence fails
  - — Most stabilizing
- Relieves decision time pressure
- Man-in-loop
- Most efficient weapon delivery
- Survivable
- Recallable
- Reuseable
- Rapid global conventional capability
- Proven in combat

SLBMs



- Use when deterrence fails
- Survivable
- Low cost/warhead
- Prompt response
- No recall
- No recycle
- No conventional use

The Balanced Triad

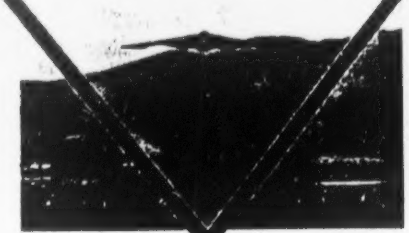
B-2 Stealth Bomber

STRATEGIC TRIAD

ICBMs

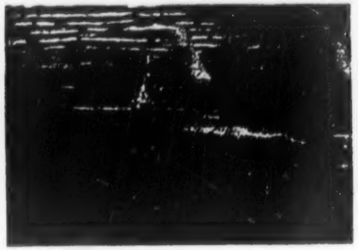
- Use when deterrence fails
- Low O&S cost
- High day-to-day alert
- Immediate response
- No recall
- No recycle
- No conventional use

~~BOMBERS~~



- ~~Demonstrates resolve in crisis before deterrence fails~~
  - ~~— Most stabilizing~~
- ~~Relieves decision time pressure~~
- ~~Man-in-loop~~
- ~~Most efficient weapon delivery~~
- ~~Survivable~~
- ~~Recallable~~
- ~~Reuseable~~
- ~~Rapid global conventional capability~~
- ~~Proven in combat~~

SLBMs

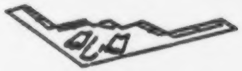


- Use when deterrence fails
- Survivable
- Low cost/warhead
- Prompt response
- No recall
- No recycle
- No conventional use

Each President Has Requested More Options

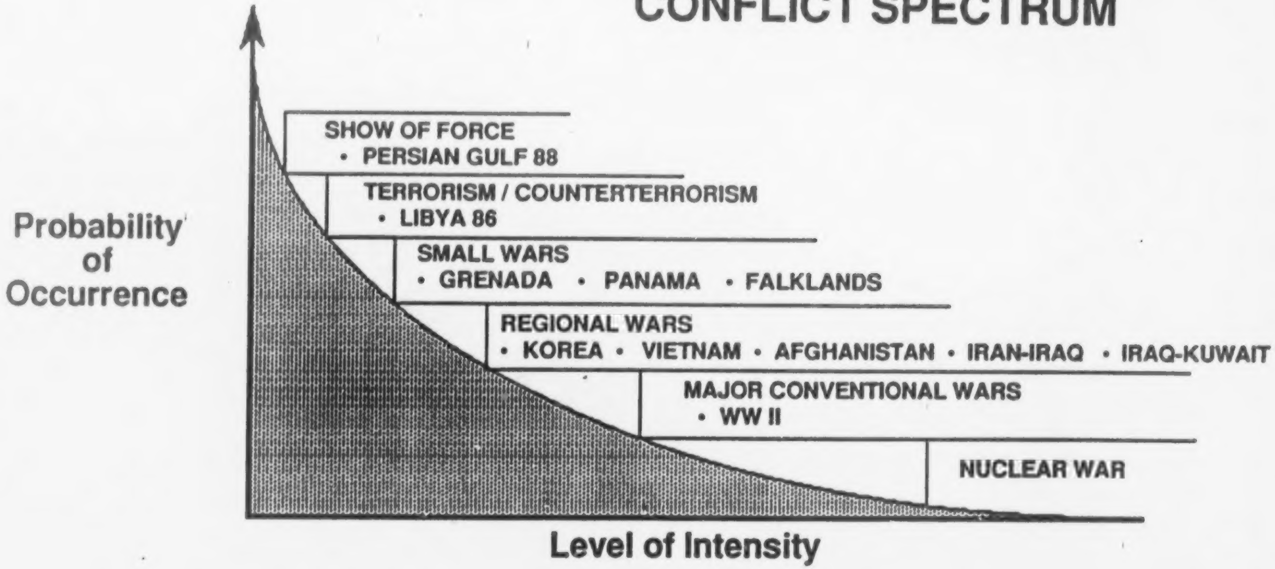
What History Tells Us

Conflict Across the Spectrum



B-2 Stealth Bomber

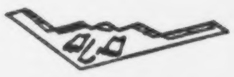
CONFLICT SPECTRUM



U.S. MUST BE PREPARED TO RESPOND RAPIDLY ANYTIME, ANYWHERE, AT ANY LEVEL OF CONFLICT

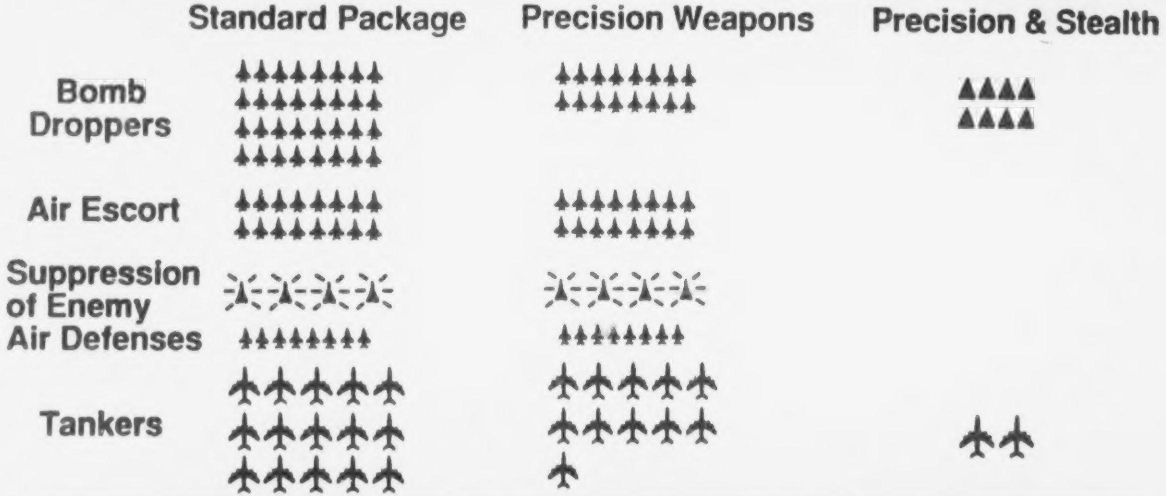
F-117:

Combat Proven Stealth



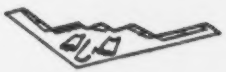
B-2 Stealth Bomber

"F-117s, REPRESENTING 2.5% OF THE COMBAT ASSETS, COVERED 31% OF THE TARGETS IN THE FIRST 24 HOURS." Secretary of the Air Force

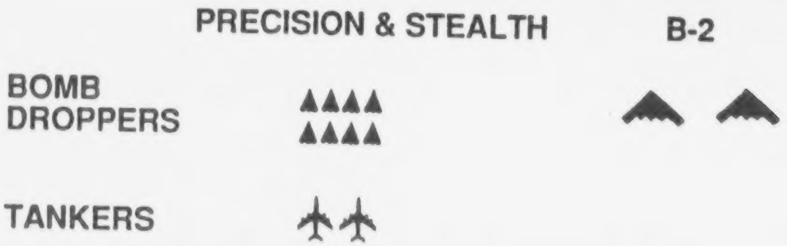


F-117 EXPERIENCE PROVES INVESTMENT IN LO PLATFORMS HAS A VERY HIGH PAYOFF IN TERMS OF RISK TO OUR AIRCREWS AND PRECISION WEAPONS DAMAGE TO THE ENEMY

B-2:
The Next Generation Stealth


B-2 Stealth Bomber

IF YOU LIKE THE F-117, WAIT TILL YOU SEE THE B-2


PRECISION & STEALTH

B-2

BOMB DROPPERS

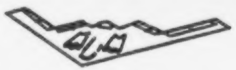
TANKERS

- BALANCED LOW OBSERVABLE DESIGN
- HIGH AND LOW ALTITUDE OPERATION
- LONGER RANGE WITH GREATER PAYLOAD
- TERRAIN FOLLOWING RADAR
- FAR LESS TANKER SUPPORT

GREATER OPERATIONAL UTILITY

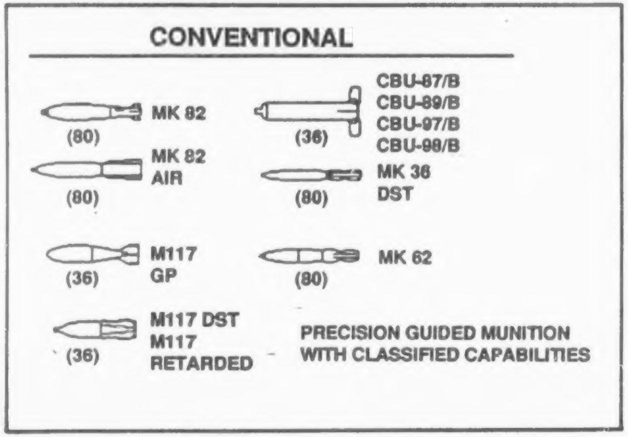
Large Payload & Accuracy

Conventional



B-2 Stealth Bomber

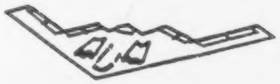
- THE B-2 REQUIRES LESS THAN HALF THE SORTIES AND ONE THIRD FEWER BOMBS THAN THE B-52 TO ACCOMPLISH THE SAME LEVEL OF DAMAGE TO AREA TARGETS
- IN THE FUTURE, HEAVY BOMBERS WILL ALSO HAVE TO SURVIVE THE HIGH THREAT ENVIRONMENT AND ATTACK WITH SURGICAL PRECISION
  - LARGE NUMBER OF SOVIET EXPORTS TO MANY THIRD WORLD COUNTRIES
  - THEREFORE, WE WILL NEED TO CARRY A WIDE VARIETY OF CONVENTIONAL WEAPONS


CONVENTIONAL
(80) MK 82
(80) MK 82 AIR
(36) M117 GP
(36) M117 DST M117 RETARDED
(36) CBU-87/B CBU-89/B CBU-97/B CBU-98/B
(80) MK 36 DST
(80) MK 62
PRECISION GUIDED MUNITION WITH CLASSIFIED CAPABILITIES

The B-2 combines survivability of the F-117 with the greater payload and range of the B-52 – the best of both worlds

Quick Response

Over Great Range



B-2 Stealth Bomber

ATTACK FROM SOVEREIGN BASING

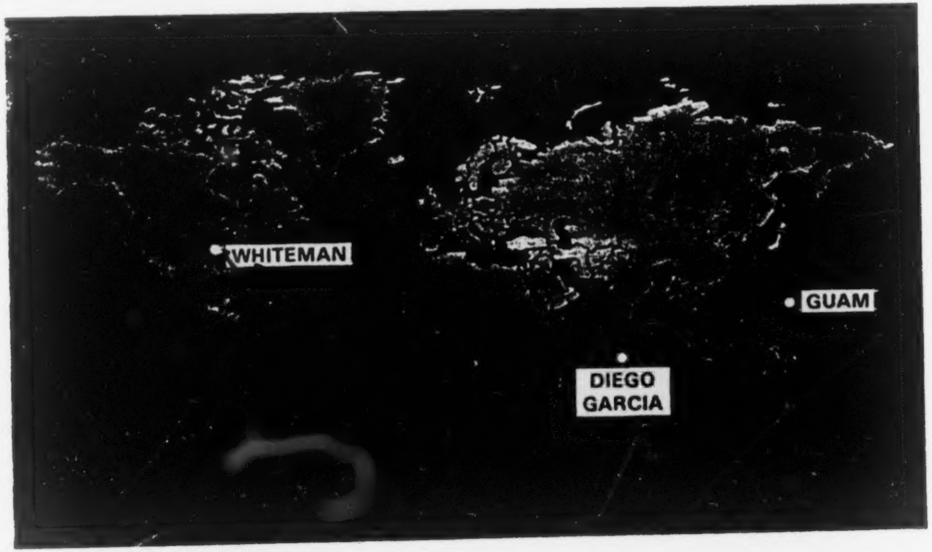
- **B-2 ALLOWS EXTENSIVE COVERAGE OPERATING FROM A SECURE CONUS BASE**
  - OR, FROM THREE SEPARATE BASES, WORLDWIDE COVERAGE WITH A SINGLE REFUELING
- **COUNTERS THE REDUCTION OF OVERSEAS BASING**
- **MINIMIZES THE POTENTIAL FOR ESCALATION OF CONFLICT BY RAPID PROJECTION OF COMBAT POWER**

B-2 Conventional Capability

Worldwide Force Projection Capability

B-2 Stealth Bomber

- 40,000 LB PAYLOAD + ONE REFUELING COVERS GLOBAL LANDMASS


WHITEMAN
GUAM
DIEGO GARCIA

B-2 CAN HOLD VIRTUALLY EVERY TARGET IN THE WORLD AT RISK WITHIN 24 HOURS

Summary

B-2 Stealth Bomber

- **Stealth works**
  - DESERT STORM validated
  - Successfully tested

- **Global Reach, Global Power Mission**
  - Nuclear - Conventional
  - More imperative for unstable future world

- **Affordable Force Multiplier**

**SOUND INSURANCE FOR U.S.
SECURITY INTO 21st CENTURY**

General CROKER. Thank you, sir.

For those of you who do not have the chart, there are three packages. The first represents a standard package of, for example, F-16 aircraft that are conventional aircraft and did not have precision weapons. They were accompanied by fighter aircraft that provided cover in the event that the Iraqis put up their own fighters.

They were covered by airplanes that jammed their radars or suppressed their radars, attacked their radars. And they were supported by a number of tankers.

We were also able to use the F-111 with precision-guided weapons, laser weapons, so we could use fewer airplanes, but we still had the problems of fighter cap, jamming of radars, and tankers.

On both of those first two packages, the standard and the precision package, they basically went against one target. In other words, they needed to be in a group to be protected.

The thing that is immediately apparent visually with the F-117 was that it took fewer aircraft to get the same damage. No. 2, they went in basically alone. And No. 3, their tanker coverage was far less.

The thing you do not see on this chart is that each of those aircraft was able to cover at least one different target, in some cases two. So where a standard package would perhaps do a level of damage to one target, the same package of stealth could damage as many as 11 or 12 targets.

So the first advantage, to restate this, is the support package in terms of dollars is much smaller, and you can do, if you would like, a life-cycle comparison there. The second thing is that a stealth program allows you to cover multiple targets with the package you do have, not one target. And the third and most apparent is the number of aircraft and people put at risk.

The thing that you do not see here, also, is that we lost no 117's nor did we damage any. So the loss of people, trained people, the need to have air rescue packages and retrain people is also a cost avoidance.

So I would say in those four ways stealth gives you a great deal of cost savings. Now, if you extrapolate that to the B-2 you then get into the comparison Mr. Welch has already talked about with the number of additional weapons, the range and the payload, the ability in the early stages of the war to fly a long distance and do this before the rest of the support package gets in place.

B-2 VERSUS B-52

Senator INOUYE. How would you compare the B-2 with the B-52?

General CROKER. Sir, I would say that the B-2 and the B-52 are very similar in terms of their range and payload. In fact, the B-2 is a little bit better in terms of range and payload. But for practical purposes, it is not dissimilar. Again, it is about five to six times as great as one of the tactical fighters, but it has the capability to fly 6,000 miles unrefueled, fly 11,000 miles with one refueling, and the air speed is very similar.

The cost of maintenance day to day, the O&M costs, are almost identical as well.

Mr. WELCH. I might comment in terms of the application of that. As we all know, we are in a very strongly decreasing top line with respect to our budgets. The missions that, in fact, the Air Force has to perform are not changing that much. So the ability to perform the missions for less cost, whether that cost, certainly measured in people as well as dollars, is something that provides a powerful incentive to look at aircraft such as the B–2.

So we have both the application of technology as well as the meeting the budget ceilings match to with force structure. So we are trying in this instance to apply the low-observable technology as a leverage on force structure, as well as a leverage on cost of weapons delivered. That is particularly important, obviously, in this time period.

Senator INOUYE. On similar missions, the B–52, on the one hand, would need radar suppressors and fighter escorts, will it not?

General CROKER. Yes, sir.

Senator INOUYE. And the B–2 will not require that?

General CROKER. I would not like to make the blanket statement, because I could foresee a situation when it would be helpful to have some. But as a general statement, I would say that in most scenarios we would operate the B–2 without defense suppression or fighter support.

Again, a country like Iraq or some of the other Middle Eastern countries that have a very dense air defense setup, in other words a very small geographical area and a great number of radars, might require some initial work for any aircraft. But as a general rule, you could dispense with a great deal of the air support and defense suppression.

Senator INOUYE. What aircraft would be most survivable, the B–52 or the B–2?

General CROKER. Sir, there is no doubt that the B–2 should be far more survivable, for a much longer period of time.

Senator INOUYE. I have many other questions, but I have come to the second round. So may I call upon my vice chairman.

Senator STEVENS. He was here before me.

Senator INOUYE. Senator Leahy.

Senator LEAHY. Thank you, Mr. Chairman.

Mr. Secretary, General, good morning. I am interested in your testimony this morning and your opening comments. The cost of the B–2 program has been a major concern to the taxpayers in my State and I hear about it virtually every week when I am back home.

A single stealth bomber costs considerably more than Vermont's annual budget. And even when we look at that $845 million cost per plane, we are concerned that the price is going to go even higher.

I think that part of the problem, even though they are entirely different types of airplanes, in that the ghost of the B–1 is haunting the B–2. I think people have a right to be concerned about the escalating costs.

I understand the Air Force cost estimate is a floor, it is not a ceiling. It makes the assumption that manufacturing techniques will improve and that testing is going to go smoothly.

But that really has not happened since this program started. Manufacturing trends are not matching the Air Force optimism and defects still plague the program. DOD figured the first two planes on the tarmac might have 160,000 defects under a worst-case scenario. Actually they logged over 100,000 defects apiece.

We seem to be showing a lot of faith in a complete turnabout in contractor performance. But, at least what I have been told about the third plane, it does not seem to be faring much better. The only constant we seem to have is the rise in costs every time we deal with the problems.

In 1987, it was estimated that the first aircraft would take 2.1 million manufacturing hours to build. I have seen figures that is off by about one-third, in the contractor's favor of course. The trends in travel work and design changes are also causing a lot of alarm.

Testing is another shaky assumption. We have got generational leaps in technology, but the Air Force is building planes before adequately testing the prototype. In fact, the Air Force had bought 10 production planes before the first flight even occurred.

The Air Force told Northrop to skip the prototype stage, just build the planes to production standards. That would mean, if we approve the fiscal year 1992 request, over one-quarter of the B–2 production planes would be on the assembly line before 5 percent of the flight test program is completed.

If I am correct, the B–2 has flown about 170 hours out of a 3,600-hour flight test program, and the Air Force is telling Northrop to speed up production while you do not have real data on performance capability based on testing. Accelerating production is going to lead to costly overhaul of systems when we find defects, unless we get very lucky and find none.

The Department of Defense seems to have a double standard for testing new aircraft. We have two other revolutionary planes being considered—the V–22 and the ATF. Four V–22 prototypes have flown over 400 hours; two ATF's have flown over 150 hours. But not a dime has been spent on production for either system. They are held to a different standard.

The B–2 production schedule seems to flaunt every rule and I just do not see the justification for this. The cost estimates will go up again. They always do. I do not know how that can be excused. You are building planes with an enormous number of defects without adequate testing, without any idea of what the final cost is going to be. We have a real problem. If the rising costs do not bring the B–2 down, well then the American public is going to.

B–2 DEFECT COSTS

Let me ask some specific questions. Is it true, General, that the B–2 cost assumes manufacturing improvements? Are we going to see defects on the planes four, five, and six? We talked about the ones on one, two, and three. Are we going to see defects on planes four, five, and six? How many and what will that do to the cost?

If you have to make an estimate, I realize it would be an estimate, but what would be your estimate?

General CROKER. I would say that we have seen the defects go down on each aircraft. We have seen the travel work go down to the point that by aircraft number seven it will practically disappear.

We have seen the cost go down steadily. In fact, the cost, the flyaway cost of the last airplane in 1991 dollars will be $247 million, as opposed to the figure you quoted today.

I would disagree with you that the cost estimate is a floor, not a ceiling. Our estimate and the OSD's Cost Analysis Improvement Group estimate have a shared view of the ultimate cost of the program. And it is a cost-plus contract, not a fixed price contract, so there is cost growth anticipated in there and accounted for, and our budget is adequate to do that. We have budgeted to the most probable cost, not the cost we would wish it to be.

I would disagree with you that we skipped the prototype. In fact, this committee and others were instrumental in suggesting that we build an airplane on production tooling because the trick is not to hand-make one special aircraft; the trick is to prove that you can replicate this very, very difficult outer mold line on a repeatable basis. In other words, we were directed to incorporate the tooling and make the first aircraft a production quality aircraft, and we have done that.

Senator LEAHY. Let me make sure I understand, General. You are saying that those cost estimates are a ceiling? They will not exceed it? We can rest assured then in this committee that it is not a floor, that it is a ceiling? You said you disagreed with my point on that.

General CROKER. Sir, what I disagreed with, that you said we did not account for potential growth. I did not attempt to say that the cost will not grow under any circumstance. What I said is that we have budgeted this program to the most probable or most likely cost, that unlike some other programs I manage we agree completely with the OSD cost estimating process about the likely or the ultimate cost, and that we have a budget to support that.

Mr. WELCH. Mr. Leahy, if I may make a comment——

Senator LEAHY. I am still confused. Is it a ceiling or is it a floor?

Mr. WELCH. If I may address the question, it is neither a ceiling nor a floor. I think you are addressing yourself to the ability to forecast costs and price. Now, I would say the first thing that, as a caution, is that one needs to look at the measure of performance as we put it together and the measure of plan as we put it together and budget to.

First I would point out there is no one alive that can tell you what the floor or the ceiling is, or should they. This is a risky business. I do not think that should come as any news. We are trying to apply the best management we can and the best parametrics to measure where we are going to go.

I think we have had some stability in the cost. The numbers that you quote, whether it be scrap and rework, whether it be defects, et cetera, are quoting numbers from a regime that has not been available for comparison before. The decision to build this airplane on production tooling, as pointed out by this committee and others, turned out to be not a decision. There simply is no other way to capture this technology in a flying aircraft than on hard tooling.

B–2 PERFORMANCE PROBLEMS

Senator LEAHY. Well, you understand, Mr. Secretary, I am not arguing the numbers and I am not criticizing the numbers. I am just trying to get some kind of a feel. I have been involved in looking at the stealth bomber back for years before anybody knew, or at least the public knew, there was a stealth bomber.

I was seeing these numbers going in and seen them escalate. I saw the estimates in this committee and in another committee, both for the B–2 and the stealth fighter. I have watched both programs for years. If you go back into some of the transcripts from some of the classified sessions you will see that I raised the same questions.

All I am trying to do is get a number so I know where it is going, partly because one of the questions I am going to be asked as a legislator, what have you voted for?

Let me ask you this, Mr. Secretary. You sent a letter last year to the chairman of Northrop criticizing that company for some serious performance problems. Did these problems occur in the B–2 program? I am talking about the letter of June 5 to Kent Kressa.

Mr. WELCH. That letter was addressed to the chairman of the corporation on the basis that we had some questions with respect to the processes and their approach to a number of programs that they had in the organization. I would not find that letter unusual in any way. It is a normal piece of business correspondence.

Senator LEAHY. But were these problems on the B–2 at all?

Mr. WELCH. Yes, sir.

Senator LEAHY. They were, OK.

Mr. WELCH. But I think that I would like to make clear that they were on several programs. We have day-to-day discussion, as well as month-to-month discussion, on an individual program basis. The question there was to draw attention to solving problems across several programs and getting closure, so that again we and you can have confidence in the costs that we anticipate and performance.

Senator LEAHY. Did the U.S. Government take any action against Northrop as a result of that?

Mr. WELCH. As a result of that letter?

Senator LEAHY. Well, either as a result of the letter or as a result even of the problems that you identified involving the B–2?

Mr. WELCH. Yes, sir.

Senator LEAHY. What type of actions?

Mr. WELCH. I think there are very normal remedies with respect to letters in terms of process improvement, that goes through the normal function, the application in some of the contract areas where the relationship allows the withholding of money payment. There is a whole series of remedies and we believe that we have used those remedies and seen performance improvement.

Senator LEAHY. Could you do this, Mr. Secretary. Could you have your staff prepare for me the specific steps taken involving the B–2, any specific steps taken against Northrop of withholding, withholding of funds or anything else?

Mr. WELCH. On all of their programs, sir?

Senator LEAHY. No; on the B–2.

Mr. WELCH. OK; certainly.

Senator **Leahy**. Thank you.

Senator **Stevens**. Can we have that for the committee record?

Senator **Leahy**. Sure, whatever way. I just want to see it.

COST TO TERMINATE B–2

General Croker, what are the costs to terminate the program at six planes, those that would be used for the test program? I realize that is not something you are encouraging, but I was just curious what the cost.

General **Croker**. Would you repeat the question?

Senator **Leahy**. What would it cost to terminate the program at six planes?

General **Croker**. Sir, we have spent $30.8 billion to date. If we were to stop today and spend no more money other than the termination costs, is that your question? In other words, you would get pieces of more than six airplanes, you realize that?

Senator **Leahy**. I understand, I understand.

General **Croker**. Sir, I could only speculate. I can provide the answer in a minute or so if I look it up. To stop at the 15, I know very well the figure there; it would take about $36 billion. So I would presume that it would be a lesser figure, probably in the vicinity of $1 billion, $1.5 billion or less. But that is only an off-the-top-of-the head answer, sir.

Senator **Leahy**. Why do we not do this, General. You might check, because my time I believe is just about up. If you might check that and be able to provide it for the committee and for the record.

General **Croker**. Yes, sir.

[The information follows:]

Specific Steps Taken Against Northrop Involving the B–2

The B–2 FSD contract is a Cost Plus Incentive Firm [CPIF] type contract. The contractor is at minimum fee due to his current over-target status. Due to the cost type contract, no "withholds" have been taken. However, the contract has an award fee. The award fee is used to emphasize and incentivize important aspects of the B–2 program. These aspects involve achievement of performance requirements contained in the System Maturity Matrix.

The Low Rate Initial Production [LRIP] contract is a Fixed Price Incentive Successive [FPIS] Targets contract. Although no withholds have been taken to date, it should be noted that the administrative contracting officer recently issued a letter of intent to withhold $5 million from Northrop until they bring their work measurement system into full compliance with DOD standards. If appropriate corrective actions are taken, no withhold will result from the notification of intent.

Senator **Leahy**. And you just might want to have your staff talk to mine and get down to some of these specific follow-on questions that I have.

General **Croker**. But as I understand your question, you want to terminate with six and complete the development, in other words complete the development program? You are not recommending buying six airplanes and then putting them in mothballs.

Senator **Leahy**. That is right.

General **Croker**. All right, sir. We will provide for the record the cost to stop the program at six aircraft or the aircraft we have already acquired and the cost to complete the development program.

[The information follows:]

COST TO TERMINATE PROGRAM AT SIX PLANES—B–2

At the present we have $30.8 billion (Then Year) dollars committed in the B–2 program. It would take another $1.4 billion (Then Year) dollars to stop the program and meet the termination liabilities. At that point, we would have a total of $32.2 billion (Then Year) invested. This funding will buy the six aircraft, two test fixtures, and associated flight test equipment.

With the current $30.8 billion (Then Year) and an additional $5.6 billion (for a total of $36.4 billion) we can complete 5 retrofittable Full Scale Development [FSD] aircraft and 10 Low Rate Initial Production [LRIP] aircraft.

To complete the planned seventy five (75) aircraft buy it would take the current $30.8 billion (Then Year) plus an additional $34 billion (Then Year). This expenditure is what truly enables us to benefit from the large investment that we have already made. The total cost of the seventy five (75) aircraft program is $64.8 billion (Then Year). This estimate includes Research and Development, Production, and Military Construction funds.

B–2 PROTOTYPE

Senator LEAHY. My last question and I will submit the rest for the record: Mr. Secretary, I spoke of the V–22 and the ATF in my opening statement. I mentioned that V–22 prototypes have flown over 400 hours, the ATF for 150 hours. Both before any production had been OKed.

Why was the B–2 treated differently? Why did we begin production even before, long before, the first flight?

Mr. WELCH. I would suggest that we look at the definitions to start with. The V–22 is really an airframe prototype that was flying.

The ATF air vehicles are, in fact, not prototype air vehicles. They were a part of the demonstration validation phase that was looking for risk reduction in the front end of the program with respect to air vehicles that are configured in a low-observable configuration with new flight control systems and all. They are not representative of what might be called a prototype in terms of the V–22.

If you look at a bomber program, the cost to try to do that, particularly in the low observable area and the tooling, et cetera, that goes on with that for demonstrating low observability, would effectively be prohibitive because it would be very close to the full-scale development type costs that we have experienced as we went into the program.

I would caution that the air vehicles that flew in the ATF program, again, were for demonstration, validation, risk reduction. They would not and have not been used for low observability measurements.

Senator LEAHY. The question still remains: Were they used—is there basically a different attitude about the test programs for these planes?

Mr. WELCH. Not at all.

General CROKER. Can I try and expand on that from a different perspective? We did 3½ years in the intellectual and planning work before we ever even got to risk reduction. We did 3½ years of risk reduction of the type you've just described, and we're going to have an 8-year development program, coupled with a 6-year test program.

So, basically, in this program we are going to have had 15 years of risk reduction and testing by the time we deliver the first aircraft to Strategic Air Command. We have had 144,000 hours of various types of testing of components. We have flown the flying testbed with the avionics in it over 2,000 hours. We have flown the air vehicle itself over 170 hours.

I guess I would object in a fundamental way to your claim that we have had—no, to use your words, not adequate testing. This has been the most adequately tested aircraft in history in my view with those 15 years before we delivered the first aircraft.

But the reason we did not prototype, Senator, was because we had to prove to you, not that we could hand-make one of these, but that we could replicate these in number on production tooling. That was the challenge in this airplane, not to build one stealthy airplane but to demonstrate the capability to build them in volume. And that is what we have done.

Senator LEAHY. This obviously is going to be a longer debate and I have taken time and I apologize to the chairman and the ranking member. Thank you.

Senator INOUYE. Senator Stevens.

Senator STEVENS. Mr. Chairman, it does look like it is going to be a long debate this year, there is no question about that.

Let me state to begin with that I have some questions. They are sort of devil's advocate type of questions, because I am an advocate of the B–2. I think the F–117 has demonstrated the total efficiency and reliability of the stealth concept in terms of modern high-technology warfare, and certainly those people that the chairman and I talked to in the Persian Gulf theater who had flown the F–117's are probably the most impressive young people I have ever seen and had the privilege of visiting with.

They emphasized time and time again how confident they were of surviving in a very hostile situation in a F–117. And as you have mentioned, Mr. Secretary, not one of them had a scratch.

So I think we have to emphasize as we look at the B–2 the whole human side of this equation in terms of protection for those who do put their lives on the line as far as the defense of this country and our interests.

Now, I noticed a statement that you made, Mr. Secretary, which indicates, that says this: "Attacking highly mobile targets is neither the reason for the B–2 nor is it likely to be accomplished with great efficiency in the near- to mid-term future."

Now, we have the low observable advanced cruise missile, the ACM, approximately the same type of system, of course without the human element being involved.

The ACM we are working on now will have a longer range and greater accuracy than the existing ALCM's, just as the B–2 will have a longer range and greater accuracy than the B–52.

B–2 TARGETS

But what targets can the B–2 engage that we could not deal with with the low-observable ACM?

Mr. WELCH. Steve, you can probably do that one. General Croker is our targeter here.

General CROKER. The problem with the advanced cruise missile, as with any cruise missile, is that it can only attack a set of known geographic coordinates, No. 1.

No. 2, that once it is launched it cannot be recalled. It has been executed.

No. 3, it is a tradeoff between the fuel in the missile and the size of the warhead. So the more fuel you get, in other words the longer you stretch the range, the smaller the warhead.

And fourth, it only can defend itself by planning ahead of time, in other words against known defenses that you can avoid, and it cannot go against area targets, sir. In other words, the warhead that it carries normally allows it to go against a fairly robust target, a surface target, let us say like the missile silo lid or some hardened target that you can identify.

The bomber, on the other hand, can be recalled once it is launched. No. 2, it can get new coordinates—again for a fixed target—in the air and change those coordinates and go look for a different target.

No. 3, with the radar on board and the people it can look at the target that it is scheduled to destroy and, if the target has already been destroyed, it can withhold. And in an era when we are going to have more targets than weapons as we get further into the arms control environment, the ability of this airplane to overfly or fly near targets and withhold weapons becomes increasingly important because we are going to have to stretch the existing weapons farther.

No. 4, it can cover area targets much better than an ALCM or an ACM. And No. 5, it actually has greater accuracy than an ACM and can carry larger yield weapons. It actually can hold harder targets at risk.

No. 6, there are certain targets, both conventional and nuclear, that require you to approach from a certain direction, in other words dispense in a certain pattern, and oftentimes it is much easier to do that with a bomber with a human element.

Finally, and most importantly in my view, No. 7, if you have an unanticipated defense, a mobile defense as it were, and you have to change your route to avoid that defense, having a man in the loop permits you to do that.

I guess the last thing I would say is that the cost per weapon is much more economical if you have a dumber bomb or a man in the loop than if you have a very, very expensive silver bullet, and a cruise missile tends to be in the latter category.

COMPARISON OF B–2/B–1B

Senator STEVENS. Again, we had an explanation while we were in the gulf war theater, but I would like it here. The B–1 was not used, was never called into service to support Desert Storm, although the flight restrictions had been lifted, it is my understanding.

Can you give us—I think it would be better for the record—a comparison now of B–2 and the B–1B—range, payload, flying hours, maintenance costs, target capability.

If I am hearing right, I am hearing former opponents of the B–1 now tell us that the B–1 is perfectly capable to take us into the next century. They opposed it at the time as not even being able to take us to the end of this century.

But it does appear to me that we are not really articulating the reasons why we did not use the B–1, because I am hearing some of my colleagues tell us that we would never use the B–2, either, so why buy it? They say: We left the B–1 in the stall; why would we not leave the B–2 in the stall in a similar conflict on a regional basis?

I would like to have some answers from you for those kinds of comments that are being made. We do know that we have to plan for conventional type conflicts like we have just been through, as well as the antinuclear concept that the B–2 really has a strong role in.

So would you give us something for the record on that. What is the comparison of the B–1, it is really the B–1B to the B–2? And what makes you think you could and would use it in a similar conventional conflict when you did not use the B–1?

[The information follows:]

MUNITIONS INFORMATION ON BASELINE B–2

The first part of the question is answered by the following chart. It shows a typical mission that compares the B–52, B–1B, and the B–2, departing from Diego Garcia to targets in Iraq and returning. The flying hours are approximately the same.

STRATEGIC BOMBER MATRIX—CONVENTIONAL COMPARISON

	B–52G	B–52H	B–1B	B–1B	B–2
Crew	6	6	4	4	2
Fuel (pounds)	250,000	254,000	208,500	189,100	>160,000
Weapons (pounds)	51 MK82	51 MK82	56 MK82	84 MK82	80 MK82
	25,500	25,500	28,000	42,000	40,000
High unrefueled (range-NM)	4840	5800	4950	4412	6700
Hi-lo-hi unrefueled (1,000 NM low)	3200	4200	3740	3210	4820
Tanker support	4.2	3.3	3.0	3.1	....

Notes: B-2 has 55 percent better fuel efficiency than the B–52H or B–1B (NM/pounds, hi-lo-hi); B-2 has a better than 40 percent payload efficiency compared to the B–52H and better than 11 percent when compared to the B-1B (weapons/pounds fuel hi-lo-hi); and B–2 needs no air refueling on a Diego Garcia to Baghdad round-trip mission.

The maintenance cost for a B–2 is $7.68M and $6.7M for the B–1B. This is the 20 year operational and maintenance costs per aircraft, per year, in FY 91 dollars.

Finally, CENTCOM did not use B–1B's during Desert Storm, since the B–1B's dedicated mission is nuclear deterrence, and the conventional B–52G's, which have been in CENTCOM contingency plans for some time, were proving extremely effective. The Air Force could, and probably would have used the B–2 against Iraq for the following reasons. Our experience in Desert Storm proved that continuing proliferation of advanced weaponry can make former "second-rate" nations "first rate" threats. We have always opted to use the most effective weapon system for the task at hand. That is why we committed one-half of our front line nuclear B–52's in Vietnam. And that is why we committed F–117's—our most advanced and expensive fighters—to Desert Storm. When the mission demands it, we use what it takes to get the job done and the B–2 will get the job done.

Mr. **WELCH**. Senator Stevens, if I might, I think it is important to, perhaps, make a couple of comments so that people can think in the right direction here. The B–52G is an aircraft that was assigned to the forces that fought in the Middle East, so the idea that the B–52G was used there, is that the way they trained to fight. Those were the people who had the conventional mission, so the obvious weapon of choice there was the one that they had trained with.

Second, the B–1, in fact, did have a difficulty with the engine, but did, in fact, during that whole time period continue to stand nuclear alert and, in fact, could pick up more of the B–52 mission if they wanted. It is dedicated to that kind of mission.

So the first thing that people need to understand is that people employ their forces in the way that they trained and planned to use them as their first option because that is the most leverage.

I tried to say earlier that force planners will look to the most effective, effective in dollars and effective in applied military capability. The B–1 has leverage over other aircraft, the B–2, as we used one metric, in dollars per pound of ordnance delivered.

So we will give you a complete matrix of that for the record. But I think the point is being badly missed that things were used as they were planned to be used and trained to be used in the gulf, and the B–1 would enter that phase after it had finished the mission it has assigned to it now, which is strategic deterrence and nuclear alert.

And it is doing that mission. It is going to do it for the time period that people planned on it. You know, there has been several suggestions that we trade B–2's off against B–1's and B–1's off against B–52's. I believe we can show you for the record that those things are done on a value analysis and building up to a force structure, and that is the way people need to look at it and I believe that is the question you are asking us, to look at it on value applied.

Senator STEVENS. Yes.

I think the F–117 was in the black part of the budget in its development period. Those of us who watched it carefully and spent a lot of time in that had confidence in it, and I think it was one of the best programs that I can remember. It was delivered on time, under cost. Performance was in excess of that that had been predicted.

Now with the B–2 we are having the opposite problem. It is coming in over cost, performance is not exactly what was predicted yet, and we are having substantial difficulties in getting it to really prove itself.

Why the difference, Mr. Secretary? Why could we not have the same performance record with the B–2 that we had with the F–117? They both started out in the black. I know Congress underfunded the B–2 for a while, but I do not think even if we had the money it would have made much difference with the B–2, the way it has come through so far.

B–2 PROBLEMS

What is the program management problem with the B–2?

Mr. WELCH. Sir, I would suggest that we need to go into details to show that. But I think that when one takes a look at a program from end to end you get a different perspective from start to success, if you stand back and look at it as we have had the opportunity to do with the F–117 now. You end up with a different perspective than you do if you live in the day-to-day maturity problems of a program like the B–2.

I would tell you that on any given day there really have not been that many differences to go through. The F–117 has been operational for over 10 years. It has gone through its maturity curve. As I mentioned when I spoke before, things like maintenance man-hours per flight hour, et cetera, were very, very high. They are now down well within the TAC standards.

What we are remembering is the TAC standard today. I can show you several instances during the F-117 program that if, in fact, we had the scrutiny that we have on our programs today, I suggest to you it would never have survived to the following day, and I would be happy to submit to the record that.

That is in no way suggesting that it was not a successful program and it is not a successful program. But if you look at the infrastructure, the development—some people even call it sort of a biological development cycle—of a weapons system, there were challenges.

They had their difficulties and at times they were behind, and at times they had financial challenges. And I think that people had—there were fewer, as you point out. People had the insight, much deeper insight into the true facts of what was going on, rather than, frankly, hundreds of people, whether they are represented in or of the Government, as to whether we have a good or a poor B-2 program today.

I would suggest that 90 percent or more of the material you see with respect to the microstructure of costing, et cetera, has to do with day-to-day costing. It has nothing to do with what the forecast was or the budget.

The budget that you have addressed and supplied has been well lived within on the B-2, as it was on the F-117. So I think I would like to actually be able to show the other part of the F-117, too, that it did, in fact, have its challenging days financially and performance and schedule, but it survived those to bring the promise that we saw today. And I would be pleased to do that for the record and I think we are very close now that we are being able to take that out of the classified budget so that we can share that with many more people.

These programs, I say again, are not without risk. The job that you have given us to do is to try to manage that risk. We get surprises when we are on the edge here of some technology applications and we are going to have to look at alternate paths.

I predict to you that when we finish the flight test program on the B-2 that we will, in fact, look back on it with the same pride and the same performance that we see in the F-117 today.

[The information follows:]

Program Management Problem With B-2

The F-117A program faced several fiscal, performance and schedule challenges. The program suffered major programmatic issues including a shortage of aerospace workers, rapidly increasing inflation, growth in material lead times and delays in security clearances. The program also suffered technical problems including fuel leaks, dual forward looking infrared turret correlation, quality control, increased tail size and exhaust gas leaks. Additionally, the first production aircraft crashed. These problems impacted the program in several ways. The first flight was delayed 11 months. Initial Operation Capability [IOC] slipped 10 months. Testing prior to IOC was reduced by 50% and full scale development cost increased by 53%. However, the unique security environment permitted problem resolution within the F-117 community, and OSD and Congressional support was maintained throughout. Despite these problems, the F-117A was successfully fielded, met all user requirements, and was extremely successful in combat.

Senator STEVENS. The F–117 clearly had its role in the type of engagement we have just come through, there is no question about that. But I think the case that has to be made for the B–2 is still the long-range concept of a deployment which can be canceled, that really deals with the climate after START, with the favorable accounting rules that deal with bombers, which the Soviets have agreed to at our request.

Do you know of any similar Soviet concept? Can we talk about that here? Is there any indication that the Soviets have intention to take advantage of the favorable accounting rules for penetrating bombers?

Mr. WELCH. I think that is a little bit difficult to talk about here.

Senator BUMPERS. Excuse me, Mr. Secretary.

Would you repeat that question, Senator Stevens?

Senator STEVENS. I asked if we could discuss the question of whether the Soviets have indicated any intent to take advantage of the favorable accounting rules under START to produce manned penetrating bombers for the future.

Mr. WELCH. I think at the discussion level we are having here the only thing I could say is, certainly it is my feeling that there is no question in my mind that they are aware of those rules. Beyond that, I could not comment here today.

Senator STEVENS. Mr. Chairman, I think we ought to get into that some time and see. If we can declassify the B–2 to the extent we have, I do not know why we cannot declassify what the Soviets are doing in a similar way, so that we can know what we are talking about when we get to the floor on something like this.

General CROKER. Mr. Stevens——

Senator STEVENS. Could you give the committee the cost per warhead delivered by the B–2 versus the MX?

Mr. WELCH. Yes, sir.

[The information follows:]

COST PER WARHEAD DELIVERED BY THE B–2 VERSUS THE MX

Direct, valid cost comparisons of the cost per arriving warhead for the B–2 and MX weapon systems are difficult to make since the systems have different probabilities of arrival, procurement time periods, alert rates and generation capabilities. Moreover, further changes to the B–2 procurement schedule could have a large effect on the B–2 cost per warhead. Given this, the best comparison to use is total acquisition cost divided by warheads delivered against the Soviet target base. Assuming a generated alert scenario, this method of comparison yields a cost per warhead delivered of $60.4 million (91$) for the B–2 and $44.5 million (91$) for Peacekeeper in Minuteman silos.

But such comparisons obscure both the synergistic contribution to deterrence and the unique warfighting capabilities of each weapon system to the Strategic Triad. For example, the key to the B–2's contribution to deterrence and warfighting capability is its flexibility in the nuclear and conventional areas. On the other hand, the MX or Peacekeeper missile maintains virtually 100% day-to-day alert at relatively low operating costs. In contrast to the B–2, it cannot be launched and recalled, can be used only once and has no conventional capability. Yet, these two very different systems together with our other strategic systems underwrite our deterrent strategy.

B–2 MILITARY CAPABILITIES

Senator STEVENS. I want to commend you on the charts. I do think that it is a very significant way to depict the progress that has been made on the stealth penetrating concept, and it does appear to me that we ought to be thinking about the fact that the world has now seen a full demonstration of what the F–117 can do, and I hope we are taking into account that in terms of the B–2, because clearly we have had a lot of our own people talking about how it might have been possible to have defenses against the F–117.

I heard a whole series of discussions one night, late into the night, about that, and it was almost as though we were giving a blueprint to the Soviets as to how to prepare to defend against the B–2 if it ever had to be used. They are the only current enemy that has got the capability that would call for the use of the B–2; is that correct?

Mr. **WELCH**. I think that we need to look at the B–2 as a capability and then to overlay it to defenses. But I think at any time you have a defense situation as illustrated by Iraq, et cetera, you certainly would want to consider the B–2. So I do not think it is simply limited to a middle European-Russian type of defense.

The defense systems all the way across the electromagnetic spectrum, from early warning, low-frequency radars, all along up to the airplane radars, are well proliferated throughout the world, and we are simply talking about density as we move from one country to another.

We have certainly also seen the fact that we would expect additional export, not less export, as people attempt to use the technology or systems they have to improve their economic positions.

So I think that your caution is a very important one, that we should keep the whole series of regions where we may be called upon to present military options under study and not just get tied into what might be the far end of the spectrum. The B–2 certainly, we believe, has applicability. In the very first sense, of course, the ability to deploy from the United States with one refueling tells us it is rather instantly available, instantly by the other measure of time, as we saw with the deployment of the tactical fighter force.

I do not think it is explicitly correct, what I am about to say, but we did see F–117's really used over there as strategic bombers, whereas we saw, in a sense, at the end, the B–52 kind of used in close air support against the dug-in troops. So again, I think we have been cautioned, and take it well, to not get locked into what had been predefined missions, rather to look at the military capabilities that the B–2 can provide us and the proper application of those.

Again, that is what I would say to people that would not use the B–2, that it would be foolish not to use that which we have invested so much money in to do the job.

TOTAL COST OF B–2 FLEET

Senator **STEVENS**. My last question, Mr. Chairman.

General, Senator Leahy asked you for the cost you are going to get for the record of the completion of the six bombers.

General **CROKER**. Yes, sir.

Senator **STEVENS**. Would you put a bottom line on that calculation and tell us then, if we are not willing to just write off the $35 billion that we have spent on those bombers so far, what would it cost us for the next 69 per unit to finish it out.

In other words, as I understand it we have got a cost of some, what, $33 billion to go?

General CROKER. Sir, we spent $30.8 billion, so we have $30 billion to go—$34 billion. And the cost, there are several different ways to compare that.

Senator STEVENS. Your chart figures it for the last 60. He has asked you to figure it out stopping at six.

General CROKER. Yes, sir.

Senator STEVENS. What is the unit cost to finish the fleet at 75, assuming the Congress would reject the idea of wasting that and leaving us with just the 6 initial bombers?

General CROKER. Yes, sir; the cost of the last 60 aircraft in then-year dollars will be $414 million apiece, in then-year dollars for the last 60.

Senator STEVENS. I want that figure for the 69 is what I am saying.

Mr. WELCH. He wants the last 70.

General CROKER. All right, sir; I will provide that.

[The information follows:]

BOTTOM LINE CALCULATIONS

The current B–2 acquisition program consists of six Full Scale Development [FSD] aircraft (five of which will be brought up to production configuration) and 70 production aircraft. The cost of the FSD progam is $21.9 billion and the cost of the last 70 (all production) is $41.8 billion.

Senator STEVENS. Thank you very much.

Senator INOUYE. Senator Bumpers.

Senator BUMPERS. Thank you, Mr. Chairman.

B–2 ASSETS

General Croker, first of all, it is nice to see you.

Secretary Welch, first of all, would you consider to be the greatest asset, the greatest capability of the B–2, to be the stealth technology, that is its ability to penetrate?

Mr. WELCH. That is a difficult question. Certainly as far as the application of new technology in the last decade or more, yes, sir, I think the application is the greatest benefit. But I think that we would be doing the aircraft a disservice not to recognize that it has been built around a balance of things.

As an example, the configuration is particularly chosen for aerodynamic efficiency, a long-range kind of thing, the flying wing configuration, et cetera. So I would not want to get hung up on one, but certainly the newest that we are flying.

Senator BUMPERS. Well, General Croker listed I think eight or nine things a while ago. Some of those things would apply to almost any bomber. Some of them certainly would apply to the B–1. The one that seemed to apply to the B–2 more than certainly any other one would be the running into unanticipated defenses.

We were able to send the F–117 against Baghdad unaccompanied, as you have said, and that certainly is a high quality in an airplane, whether it is a light bomber—I do not know why we call the F–117 a fighter, really. It is more a light bomber than it is a fighter.

But my question to you is, could you give this committee any kind of assurance that, in light of this tremendous attribute of the B–2—namely, its ability to go undetected—could you give us any assurance that the Soviets do not now have and are not likely to have in the foreseeable future the ability to overcome that?

Mr. WELCH. Certainly not. I think the first thing, I might ask that you change your question, because I do not believe anybody can or should say that any of these low observables will ever go undetected. That is fundamentally against the laws of physics.

We would expect that there will be detections of these aircraft, and certainly over a period of time as people get smarter that will happen. What I will tell you, though, is that by application of these technologies—and I think to use the words I believe the Defense Science Board used in evaluating the flight test results to date—that we have a revolutionary application of this technology here and over a period of time it should serve us very well.

I would then tell you that at that point in time we then have available to us all of the other operational or other methods to continue to use its effectiveness.

I would give you the other side also to consider, a little more difficult to talk about here. But from the very first day we started on stealth technology, we also started on counterstealth technology ourselves, and rightly so, and you have encouraged us to look at those things over the time period. And we will march those along together.

I think the work done in that area not only tells us it is wise to look at that, it, in fact, confirms what I said before: It may be revolutionary technology, but it is not invisible and not immortal.

B–1 PROBLEMS

Senator BUMPERS. Let me pursue that just a little further. The counterelectronic measures and radar suppression, or whatever you want to call it, is not our inability to do that on the B–1 one of the biggest problems with the B–1?

Mr. WELCH. Yes; I think. But again you have got to put it into a chain of things to do. The first thing that you want to do is to be able to know what, in fact, you are going into, so the thing we would most likely to get on the B–1 is what is called situational awareness.

That then allows you to use the training of the air crew, the attributes of the aircraft, et cetera, in particular to avoid defenses and all. Now, the next thing, if you cannot avoid, obviously you would like to suppress, and we have not successfully finished the installations or much less the contracting for adding the improvements to the ALQ–161 in the B–1.

The result of having done those things, though, would be, in fact, to get situational awareness and, in fact, to improve its penetrability.

Senator BUMPERS. Well, if we develop the so-called counterelectronic measures in the event the Soviets develop the ability to detect the B–2, those measures and that equipment would also be available on the B–1 as well as the B–2, would it not, and vice versa?

Mr. WELCH. Assuming that it could be installed in an airborne platform; yes, sir.

Senator BUMPERS. Now, let me ask you again a slightly revised form of my first question. Do the Soviets now have the ability to detect a B–2 bomber?

Mr. WELCH. I do not know how to give you an answer of any completeness at this level of security. But I would tell you——

Senator BUMPERS. Perhaps that is a question that we ought to discuss in a closed hearing.

Mr. WELCH. We would look forward to discussing that in a closed hearing. But I think before, earlier in this session, we talked about, again, another caution, that we would expect that any aircraft we build now or in the future will, in fact, be detected. They just are not invisible.

But detection is the first of a long chain of things you have to do. You have to detect and you have to track, convert to fire control, fire a weapon, fuze that weapon, and kill something. Now, to run down that chain with any level of confidence that you are going to be successful we do not believe is available to anybody in the foreseeable future for us.

But if you address yourself to the question of is the aircraft invisible, I have to tell you "No," whether that is in a classified or unclassified session.

Senator BUMPERS. Well, my next question is: What does the B–2 give us that we do not get, for example, with the B–1, assuming we can get it to flying?

Mr. WELCH. Well, I am not quite sure how to approach, which end of that question. I do not believe we have had a question of whether the B–1 or B–2 or any of our other aircraft can fly. I think if you have a concern of whether it flies——

Senator BUMPERS. Well, I was just alluding to the fact that the B–1 has spent an awful lot of time grounded since it became operational. Forget that part of the question.

What do we get out of the B–2 that we do not get in the B–1?

Mr. WELCH. I think if you look at the front end of the folder we put in front of you, it may be helpful to illustrate it. But I think what it gives us is air space, in the simple sense that it gives us more opportunities to approach and attack a target without putting at unnecessary risk the people in the aircraft or their ability to deliver either precision or nonprecision-guided weapons.

I think it is that simple. If you ran against a defense that was truly linked, where you had a wall, you know you are, in fact, going to have to force down that defense with electronic warfare or, in fact, roll back the defense. The B–2, in fact, opens that air space up, opens that roadway up, if you will, so that you can preplan and plan en route for something that pops up, and you can complete your mission, the probability.

Senator BUMPERS. Well, if we spend the money that you are requesting us to spend now on the B–1, would it not do the same thing?

Mr. WELCH. No, sir; and I think that is a very key point. We are talking about futures, we are talking about a system now that will come on line in the 1990's. And if history is a good judge, we will have this as a strategic bomber for up to 40 years. So we have to look very, very far ahead.

If you recall, the B–2 and the B–1 were never thought to be competitive with each other per se. They were started off as complementary programs approaching a force structure much larger than is judged to be required today. So it is not one competing with the other.

It was one that could come on line, the B–1, quite a bit sooner and, in fact, move in and do the penetration job through, as I understand it, the 1990's time period. It could then pick up into delivering standoff missiles or whatever, to be replaced by the B–2 as a penetrating bomber, and keep the continuity then of the deterrence function, which is the primary mission of a strategic bomber.

So I believe that these things are a little bit like the question you asked me with the invulnerability of the B–2. These are all part, they are a chain reaction. They are tied together. They have to complement each other. If you break this chain in any part, you are not going to get the end result.

Senator BUMPERS. Mr. Secretary, let me say for my part I opposed the B–1 bomber because I thought that it was not going to be a good penetrating bomber. And, of course, that is a separate debate on whether you really need a penetrating bomber these days.

But I voted against the B–1 because I knew the B–2 was on the drawing board and I had been told by people that I trusted that it was a fine new technology, had great potential. As a matter of fact, I was told that it was almost certainly going to work and we already had these F–117's virtually operational.

I have been for all these years a very strong supporter of the B–2. But when the costs got up to $800 million I had to start looking again at my hole card and looking at not only the costs, but also whether it was going to perform as promised.

B–2 TEST FLIGHT

Now, as I understand it, in that connection, how many hours have we flown the B–2 in test?

Mr. WELCH. About 180.

General CROKER. 170.

Mr. WELCH. 170 hours.

Senator BUMPERS. 170 out of an anticipated 3,000?

Mr. WELCH. Yes, sir.

Senator BUMPERS. See, that causes me some pause, too, because as you know Congress has been off on this fly-before-you-buy kick for some time, and here we have spent $30 billion on an airplane that at the time—we had committed $30 billion at a time when we had only flown it roughly 170 hours.

And you wonder what else we are going to run into, just as all these problems we have run into with the B–1. Nothing is certain in this world. Everybody on this committee understands that and we are trying to do two things. We are trying to make sure that this country is secure, that our defenses are strong; and that we are fair to the taxpayers at the same time, that we get the biggest bang for the buck. That is really what we are here for this morning.

ALQ–161 CORE TESTING

Mr. **WELCH**. I think that I should address two pieces of the question. The B–1 situation you talk about, there is every reason to believe that we have, in fact, successfully completed the ALQ–161 core testing now. We remain to reduce that data and have it certified.

So the ability to have the penetration capability thought to exist in the B–1B is, in fact, available. This being a B–2 discussion, but in the case of the B–1 you recall the program was, in fact, capped at $20.5 billion in base year dollars. That money has not been made available.

If the money that remains available within that $20.5 billion cap is, in fact, made available to the Air Force, we believe that we will, in fact, be very close to being able to finish up the ALQ–161, the avionics system.

So I think the B–1 has addressed the things that you were promised and getting them in a well-tested fashion, which you are asking. The B–2 you referred to, and I told you approximately 170 to 180 hours of 3,400, and mathematically you are explicitly correct. But with respect to judging the flight test program it is explicitly incorrect, because if you look at the last hundreds of hours of that flight test program, it is paperwork verification, the tech order verification, additions to training, the ability to clear all the weapons that are going on over many configurations of flight.

I personally would value the first 500, the first 200 hours that we have seen in terms of confidence in being able to deliver the military capability and do it at the ability to estimate the cost of that on a ratio of maybe 90 percent to 10 percent. Those first 200, 500 hours are going to tell us if we have got show-stoppers, if we have got major design functions; and the first report we have delivered now that says we do not have show-stoppers in the low-observability area.

So I would simply caution that dividing 3,400 or dividing 200 hours into 3,400 hours is not a measure of a flight test program.

Senator **BUMPERS**. Mr. Secretary, we get a little wary here because we see the B–1 lose an engine, go down because a bird flies into the engine, because the fan blades fall apart. And I assume that it was also flown roughly 3,000 hours in testing.

Mr. **WELCH**. Sir, in the first place I would say to you that you have encouraged us to look at the concurrency of our test programs and the completeness of our test programs, both development tests as well as operational tests. I believe we have addressed those in a very disciplined fashion.

As far as the engine is concerned, we typically operate jet engines at a very demanding part of their spectrum. The good news, if there is with respect to engines, is we are, in fact, getting more performance than we expected in terms of the engine-airframe combination and, in fact, that has been stressing the engine.

At no time during that engine difficulty that we had did we, in fact, not have aircraft capable of standing alert.

If you look at the engine, we have in all of our mature aircraft, will always have, a durability problem with respect to engines. You look in the commercial world, where they are operated in a very down-rated fashion for safety reasons and others not available to the military; there are engine problems. And you see almost the identical problem that we saw with the B–1 in one of the large airplane crashes, where they had a disc failure, a fan disc with respect to the engine.

So these are things that we mature with. We have a technology that is 20-some-odd years old in those engines now. If you look at the core of the engine that we are working with right now, it is the same. The fans are different. And as we go to more durability in the B–1, you will see a different fan blade.

As far as the ALQ–161 is concerned, the B–1A preceded the B–1B. It can be thought of as a prototype, if you will. We did not satisfactorily judge the completion of the testing that went on on the airframe-engine combination with the testing and the threat change that went on in the electronic warfare.

We were displaced in time at the start of the B–1B program. If you recall, the RDT&E and the production contract were signed the same day. That would not happen today and did not happen on the B–2, and I think the criticism of doing those kind of things was well warranted, but we have responded.

B–52 REENGINING

Senator BUMPERS. Two quick questions, Mr. Chairman.

Mr. Secretary, are you familiar with the language I put in the appropriations bill last year on the B–52?

Mr. WELCH. Yes, sir.

Senator BUMPERS. The reengining and so on. When can we expect a report on that?

Mr. WELCH. I believe August. The people are hard at work on that. It is a very broad question and a good question but you should expect to get a formal submission from us during August.

Senator BUMPERS. Just off the top of your head, for you and General Croker both. I was so impressed, I have been so impressed with that possibility, and the B–52's can indeed perform a useful function for some time to come. If you did that, at a cost of about $32 million per plane, at least on the H's and maybe a few of the G's, think about the range you would get and the fuel savings, 1,000 barrels per mission.

We are talking about $30 billion additional here, and you can reengine and reoutfit these H's, for example, for a little over $2 billion. It pays for itself just on fuel savings over the life of the airplane. It seems to me that that is the kind of thing that you people ought to be jumping on like a chicken after a june bug.

Mr. WELCH. Well, Senator Bumpers, we are trying to get onto both of those items. But the cost of ownership is the key issue, as you point out, and I think that is why people are very carefully looking at what is suggested, because the airframe and the available potential for new engines on the B–52 are quite real, but the cost of ownership as you run it out over those years—and we will respond to you in August of this year.

But to date, not that it has not been looked at, we simply were not able to run out that life-cycle cost equation as compared to what we might get with the new aircraft, and that was particularly driven by not having as large a total budget available to put into this mission area.

So we have got to look at day-to-day efficiencies as well as life-cycle efficiencies, as you well know, as we approach our budgeting problem. But we will have that for you in August.

Senator BUMPERS. Well, Mr. Secretary and General Croker, I appreciate your testimony this morning. I intend to review this testimony again before we get it in markup on the B–2. I also am looking forward to the GAO report on the B–2 which is coming out in June and will probably be influenced to some extent by that.

I do not know how I am going to vote on it this year. I must say it still blows my mind when I think about spending over $800 million for one airplane. And I know all those arguments about how you get eight times bigger payload than you get on the F–117, the stealth technology. I know all the arguments.

But I am just going to reserve judgment at this point.

Mr. WELCH. As you know, you do those calculations, I think, in the same way with the number of flight test hours, you have to put into that equation the sunk costs, so the dollars per aircraft to go is the telling one.

Senator BUMPERS. I understand.

Mr. WELCH. And we will certainly supply as much information as you like.

Senator BUMPERS. If we torpedo the program now, the six or seven we are going to get are going to cost $5 billion each.

General CROKER. When I got to Blytheville, sir, the first thing they told me was that I could run alongside the bus and save 50 cents or I could run alongside a taxicab and save $5.

Senator BUMPERS. I am not sure I understand that. [Laughter.]

General CROKER. There is a low-cost option, sir, but there are some deceiving savings in there.

What I am concerned about, as you know from your time with me, we have got some airplanes that are today 37 years old. By the time you are talking about to make the engine reengining payback, you are talking about at least another 15 years and beyond. You would be talking about a 50-plus-year-old aircraft.

The one thing we saw at Blytheville is that we could predict fatigue by stress—in other words, if you twist a Coke can enough times it falls apart—but the one thing we could never predict was corrosion stress. It literally is not predictable, and we have seen in the tanker and the bomber that we have at Blytheville and at other places unanticipated fatigue.

The other thing we have seen is just the cost of trying to repair things that people do not make any longer, and the technology from the B–52 was in the late 1940's. We got the airplanes—I had the oldest and the newest airplane at Blytheville and they were 1955 and 1957 year, 1955 and 1957 airplanes.

So the whole idea of what we do not know in the cost of ownership is a really, really big concern, not to mention the relative comparison in the lives we would put at risk. Your comfort in asking a crew member to be flying a 50-plus-year-old airplane probably would not be high.

Senator BUMPERS. Boeing, of course, in their projections said that this plane could easily last into the 2020's to the 2030's, 2020, 2030, if we did these things at a cost of $30 million to $35 million per plane. You disagree with that, I take it, Steve?

General CROKER. Sir, you are asking me if I would be comfortable with it and I would not, for the reasons I have already explained. The engines would be new, but you have got the whole rest of the airplane that you have to have a parts system for. You have to have people, suppliers that you can go to and make parts for.

Some of the technologies in the airplanes today—again, in the airplanes at Blytheville we broke a few control rods. We had to go to the boneyard at DM and take out those control rods because there was not anybody in this country that any longer uses the manufacturing techniques to make those kind of rods.

That is the part of the problem that gets very, very difficult to talk about. But I mean, it is sort of like the argument, you know, American Airlines or TWA is near bankruptcy, why do they not go back and fly C–47's because they were a lot cheaper. It is just they are getting awful old.

Senator BUMPERS. I also want to say that I hope the Air Force—you know, I always have this suspicion; we have to be suspicious on this side of the table—that you have a concern that if you accepted Boeing's suggestions about reengining the B–52's that somehow or other that could torpedo your efforts to get the B–2.

I consider those two separate issues totally and so I hope the Air Force will not allow that sort of psychology to interfere with your report to the Congress.

General CROKER. We are not proposing to reengine the H. We do not really have to do that.

Mr. WELCH. Sir, I think to get back to the statistics, I have spent only 4 years almost here in this job and the rest of my 40 years in the aerospace industry on the other side. I would tell you I think the contractor does his very best to give you the numbers within the environment that he can control.

But I think, as General Croker points out, I do not think that any contractor has the ability to predict the corrosion cycle or the use cycle of the airplanes in the military environment. So they have given you the very best they have, but if, in fact, you were to turn around and say, as many people are interested in these days, could we warrant those for 40 years to go or something like that, I believe you would see certainly a cost impact and a question whether it was physically possible to do such a thing.

Senator BUMPERS. Mr. Chairman, I would like to put in the record an article from "Defense News" dated April 2, 1990, where Barbara Amouyal of the Information Management Division of the Air Force Logistics Command's Tinker Air Force Base said:

> The B–52G and H models can fly without structural modifications through the year 2030 and possibly 2035 if the service continues to fly the planes an average of 350 to 380 hours per year.

Now, that does not come from Boeing; that comes from your own organization.

Senator INOUYE. Without objection, so ordered.

[The article follows:]

[From Defense News, Apr. 2, 1990]

B–52'S CAN SOAR PAST 1998 RETIREMENT DATE

Washington.—The U.S. Air Force's fleet of B–52 strategic bombers is expected to fly effectively as a cruise missile carrier through 2035 without modifications to its 30-year-old structure, according to service documents obtained by Defense News.

Current service plans call for the retirement of most of the B–52 strategic bomber fleet by 1998 as newer bombers, such as the B–1B and the B–2 stealth, take over the nuclear role. The B–1B and B–2's will serve as penetrating bombers, a role which Air Force officials say the B–52 will be incapable of performing in the next century. The B–52's use as a standoff platform in the next century, however, has not been emphasized by the Air Force, fostering perceptions of the plane's limited future.

The extended life expectancy of Air Force Strategic Air Command's fleet of 190 B–52 G and H models, equipped to strike targets within the Soviet Union with air-launched cruise missiles, is likely to influence debate raging on Capitol Hill over the cost and intended mission of the B–2 Stealth bomber, the service's intended replacement for the venerable B–52 Stratofortress, Pentagon and congressional sources say.

According to a March 6 letter and supporting documentation, prepared by Patsy Solinski of the information management division at Air Force Logistics Command's Tinker Air Force Base, Okla., the B–52 G and H models can fly without structural modifications through 2030, and possibly 2035, if the service continues to fly the planes an average 350 to 350 hours per year.

Moreover, Solinski noted, the B–52 G and H models are capable of flying a maximum of 41,600 hours and 43,100 hours in their lifetimes, respectively. Both aircraft models have flown an average of 12,000 hours so far, about 30 percent of the models' maximum life expectancy, Capt. Harry Edwards, Strategic Air Command spokesman, told Defense News last Friday.

The March 6 documentation was released in response to a Freedom of Information Act request by Steven Aftergood, a research analyst at the Federation of American Scientists, a Washington-based group critical of the $70.2 billion B–2 stealth bomber program.

"It is becoming increasingly apparent that the B–52 will suffice as a standoff bomber well into the next century, or at least until such time that the global situation is clarified," Aftergood said in an interview with Defense News last Thursday.

He added, in reference to the B–2 penetrating bomber program, "The records show that alternatives exist to preserve our nuclear deterrent capabilities. There is simply no need to embark on an extravagant new bomber program."

"Structurally, those aircraft are in good shape," Edwards told Defense News in reference to the plane's planned retirement." [But] a combination of things drives all this," he said, such as the plane's warfighting abilities and budget coats.

Air Force Gen. John Chain, commander of Strategic Air Command, told the Senate Armed Services Committee last July that the B–52 fleet was aging and would have to be replaced by 1998 because of its inability to penetrate increasingly sophisticated Soviet air defenses. Although Chain praised the air-launched cruise missile as "a very valuable weapon to—because of its accuracy," he minimized the B–52's role as a cruise missile carrier in the next century, favoring instead the newer B–1B penetrating bombers.

In the same hearing before the Senate Armed Services Committee, Gen. Larry Welch, Air Force chief of staff, criticized the B–52G and B–52H fleet for its age, which ranges from 28 to 32 years.

Supporting Air Force plans to phase out the B–52s with the introduction of the B–2 bomber fleet, Welch insisted, "The B–2 is clearly central to the continued, long-term viability of the bomber leg of the triad.

Sen. William Cohen, R-Maine, vice chairman of the Senate Select Committee on Intelligence and member of the Senate Armed Services Committee, has rejected the B–2 bomber in favor of standoff cruise missile carriers such as the B–1B and the B–52. According to Cohen, who said he voted last year to terminate the B–2 because of its high cost and dubious strategic penetrating mission, cruise missile carriers are "just as stabilizing as the B–2 would be" because of its ability to be recalled after takeoff.

Speaking at a press conference last Wednesday hosted by the Union of Concerned Scientists ([JCS), a Massachusetts-based nonprofit group also highly critical of the B–2 program, Cohen said, "The notion that you have to penetrate Soviet airspace and lay a gravity bomb over a relocatable target is not credible. * * * It seems to me that if we could save substantial billions of dollars and still achieve the intended mission, then the B–2 is one system we can afford to forgo."

Cohen endorsed a UCS report by physicist Michael Brower which assessed the cost to develop, produce, operate and support the B–2 bomber over 25 years at some $155 billion. Brower's report, "The B–2 Bomber Impossible Cost. Dubious Mission," published March 28, also found that B–52s equipped with cruise missiles could deliver about the same number of weapons as the B–2 at considerably less cost; findings which the Air Force has strongly opposed.

Lt. Col. Jerry Stringer, Air Force headquarters spokesman, criticized UCS cost estimates as "inflated * * * to incorporate every potential and possible cost associated with the B–2 program."

Senator INOUYE. Senator Johnston.

Senator JOHNSTON. Thank you, Mr. Chairman.

B–2 PERFORMANCE PROBLEMS

Secretary Welch, did I understand, in answer to a question from Senator Stevens, that you were saying there were performance problems with the B–2? Did I hear that correctly?

Mr. WELCH. I do not believe so, sir.

Senator JOHNSTON. I thought there was that suggestion and it surprised me, because I was not aware of any performance problems.

Mr. WELCH. No; as far as the test program is concerned to date, we see the performance very close to what we would have predicted before time. Now, I cannot recall Senator Stevens' particular question, but I do not believe so.

Senator JOHNSTON. I am assured by that, because that was my understanding, that radar cross-sections as well as performance, flyability, range, engine performance, all of those things are at least at standard, if not exceeding standards.

Mr. WELCH. That is absolutely correct, and certified by not only us but by the operational testers in the Department of Defense and also by the Defense Science Board.

Senator JOHNSTON. And the pilots who fly the planes think they are just gangbusters; they love them.

Mr. WELCH. Yes, sir; I think the key point now, it is just not a couple of pilots. We are getting a pretty good cross-section of people representing the operational tester as well as the test pilot. So that has been a good news story, because as long as you have the good flying qualities we predict and the good performance we predict that, in fact, helps us get on with our test program.

Senator JOHNSTON. Let me say, Secretary Welch, I think you have a lot of credibility with this committee, and one of the reasons is you do not oversell. I think maybe in one respect, though, you are underselling. In a question from Senator Bumpers, he asked, "Can you tell us whether or not the Soviets can, or in the near future will be able to, overcome the stealthy advantages of the B–2." And you said, "No, I cannot tell you that," because you took the question as being could they——

Mr. WELCH. Detect.

B–2 STEALTH ADVANTAGE

Senator JOHNSTON [continuing]. Detect. And really that is not what I understood his question to be. Or let me ask the question another way: Are we not absolutely sure that right now and for the foreseeable future the advantages of the stealth cannot be overcome?

Mr. WELCH. As far as every information available to us, we believe that that lead will be for the indefinite future. The advantages cannot be overcome.

Senator JOHNSTON. I mean, detection is, as I understand it, by long-range radar so that you maybe catch him many miles away and you know something is out there, you cannot tell exactly what. But it is quite another thing to track and particularly to track with weapons systems that can shoot the airplane down.

Senator BUMPERS. I think he said that, Senator Johnston.

Mr. WELCH. Yes; I think on page 8 of that book in front is where we were trying to illustrate this thing. And your point is exactly right, Senator Johnston.

Senator JOHNSTON. But I mean, they cannot put on some brand new radar that canceled out this advantage. I mean, that does not exist or so far as we know research is not being done on that. You have to have redundant systems, and then you do not fully cancel the advantage.

I mean, there are just natural advantages of stealth.

Mr. WELCH. I think if you go back to the next level, really, of architecture of kind of the world a little bit, we are trying to capture the advantage of surprise that has been turned over throughout the years of warfare and keep that, and stealth returns that surprise factor for the indefinite future.

Senator JOHNSTON. Mr. Chairman, it seems to me that the fundamental question we have is whether we need a manned bomber. I think it is a very serious question. I think you can talk about cruise missiles and talk about ICBM's and come up with a very rational argument that you can do without manned bombers.

But I answer that question that we do need manned bombers, for all the reasons that you have discussed here. And if we do need manned bombers, it seems to me that the B–2 is the only answer. The idea of scrapping the B–2 and going to some B–3 at some time in the future I think is absurd.

So the question then becomes, if we are going to go with B–2, do we buy it at $891 million a copy, which would be the procurement cost if we acquired only six, or do we get it at $414 million a copy, which is the way you figure it when you take off the termination cost, et cetera? And I come down to saying that we need to go ahead with the program with the full procurement rate.

Now, my question is, How many do you have to acquire to get the $414 million per copy cost?

Mr. WELCH. On the to-go? I believe the numbers that you have in front of you there were based on really getting 70 production airplanes and 5, the total of 5 full-scale development aircraft that are refurbished and delivered to the user. So a total of 75 operational aircraft went with those numbers, I believe.

Senator JOHNSTON. Now, can you get us the numbers for lesser buys, 50, 40, et cetera, because I am sure that that will come up at some point along the way?

Mr. WELCH. Yes, sir; we would be happy to supply those.

[The information follows:]

NUMBERS FOR LESSER BUYS—B-2

Based on the President's remarks there is only one buy profile. The buy profile is 75 B-2's. This is supported by the President's comments which stated the following:

"I have asked for 75 B-2 bombers, the most revolutionary military aircraft in our nation's history. And when you hear certain members of Congress complain about the B-2's cost, remember that a single B-2 does the job of literally dozens of aircraft, tankers, escorts, suppression and surveillance craft, and other bombers. And when people argue coyly that we only need a few B-2's because they're so technologically advanced, ask yourselves: Should we risk our security, the lives of our sons and daughters, and our national credibility just because some do not want to acknowledge the revolutionary advantage this weapon system will give the nation. Should we enter the 21st century, reliant upon a bomber designed in the '40s and built in the '50s? Now, the B-2 combines the range and payload of the B-52 with the advantages, the enormous advantages, the proven advantages, of stealth technology. And in the end it offers deterrence—nuclear deterrence, conventional deterrence, deterrence all across the spectrum.

Think about the costs, think about military operations, think about our long-range national security needs, and you'll conclude that we do indeed need two full wings of the B-2."

Mr. WELCH. I think it becomes very difficult as you run down to capture. It is not simply the cost of the air vehicle, because you need to have a fully supported force and a force that can be used over a long period of time.

So as you go down, what happens, you get this multiplier of a fixed cost. It costs so much to develop a new bomber. You know, if you put all of the R&D program against one airplane, you start off, before you have got the airplane you have spent nearly as much money as we have now. All the rest to go works out.

But we will supply you several of those numbers below the 75 number so you can compare it. And again, as you very well know, we do not have any way of recovering sunk costs. So the first thing we should make sure is we are taking great advantage of that sunk cost. So total program unit cost, including sunk cost and to-go, is a very good number and we should be very sensitive to it, and it is a large number, but the to-go cost is the only number that counts today.

Senator JOHNSTON. Secretary Welch, these additional airplanes would cost, what is it, $28 billion? What was that figure?

Mr. WELCH. The additional 60 aircraft that we had?

Senator JOHNSTON. Yes.

General CROKER. Yes, sir; if you terminated—some have suggested——

Senator JOHNSTON. Taking out the termination cost, the net number is 28, is it?

General CROKER. Yes, sir; if you stopped the buy at 15 airplanes, it would cost you $35 billion, so that the to-go cost in our charts here, that $28 billion is the additional to-go beyond what Senator Leahy——

Senator JOHNSTON. And that $28 billion buys you 60 airplanes?

General CROKER. Yes, sir.

LHX PROGRAM

Senator JOHNSTON. OK. And what is the new LHX Army helicopter program just recently announced?

General CROKER. Sir, the cost to go is considerably—is more than that. I do not have the figures in front of me, but it is more than the cost to go on the B–2.

Senator BUMPERS. But we are not here debating the LHX.

Mr. WELCH. Senator, if I could just make a point, we are no longer the most expensive program in the Department of Defense to go and we are pleased to report that.

Senator JOHNSTON. How would you rate the priority of the LHX, or what do they call it? The LX now, how would you rate the priority of that against the B–2? Can you do that?

Mr. WELCH. Sir, I really cannot. We would be happy to tell you how we fit our own systems in, but they are such different missions. But I am certain that the Army would value the LH as much as the Air Force would effectively value the B–2 or the ATF and the C–17.

They are first level things that we have to have if we are going to have a modernized force.

Senator JOHNSTON. When the Army comes up here I will ask them which is more important, the B–2 or the LHX.

Mr. WELCH. I think the Army will probably tell you the C–17. That is where we are trying to support the Army.

B–52 INFLICTED DAMAGE

Senator JOHNSTON. One final question, Mr. Secretary. During the recent gulf war, our B–52's pounded the Republican Guards and during the war we were not able to get verification of how much damage they were doing. Do you have indication now of how well the B–52's did against the Republican Guards?

Mr. WELCH. You might want to comment.

General CROKER. Sir, I personally do not. I can tell you only in terms of the sorties and ordnance delivered. I know there are reports being prepared by the Central Command and I just do not have access to those, sir, in terms of people or area targets destroyed or whatever.

Senator JOHNSTON. I know it is going to be very difficult to state precisely the number of tanks and all that, and I know a lot of it is going to be anecdotal. But I think we ought to get that, because we dropped an awful lot of bombs.

In Vietnam the general idea was that out there in the jungle bombing was not as effective as it might have been. I had the idea that the B–52 was pretty good in the gulf war.

General CROKER. Sir, the reports we used to get out of Vietnam when I was there was that the B–52 was the most feared weapon by the North Vietnamese infantry. The reports we got back from the Iraqis were exactly the same, that the B–52 was the most feared weapon.

The psychological impact of those bombs detonating unannounced is awesome. So we do know that it had considerable value to disintegrate their morale and cause some departures. But it would really be premature for me to try and say what type of damage or how.

It is just that the only measure of merit is that General Schwarzkopf asked for more; he did not send them home.

Mr. WELCH. Secretary Cheney has directed us over a period of time for several reports, the first to be due to him the end of this month, in terms of trying to get lessons learned and apply it to the damage and close that loop, and there is another about 2 months from now. So I believe that over the course of the next months, several months, that they will be made available in a more explicit fashion.

I think Secretary Rice was telling me the other night that in terms of talking to some of the many prisoners that were taken at the time, somebody summed it up pretty well when asked what he thought was the thing that most made him defect and he simply said the airplanes.

Senator JOHNSTON. Thank you, Mr. Chairman.

Senator INOUYE. Thank you.

Senator D'Amato.

B-1 CORE UPGRADE

Senator D'AMATO. Thank you very much, Mr. Chairman. I only have one question.

Last year, Mr. Secretary and General Croker, General Chain testified that it was essential that the core upgrade was essential if the B-1 was to be a viable penetrating bomber past the mid-1990's. Has that changed, and if so how?

Mr. WELCH. No, sir; it has not changed at all.

Senator D'AMATO. Well, what are we going to do about that core upgrade? I understand there has been a cancellation. How are you proceeding?

Mr. WELCH. Well, without any money you cannot proceed. So we have simply run out of money. What we are doing is taking the test program results and they have got to go through certification within the Department of Defense. We believe we have had a successful test program and we believe we know what it takes to improve the ALQ-161.

That material will be ready approximately July of this year and at which time we will put together data and, in fact, come back and identify the funds and ask for them to complete the program.

Senator D'AMATO. Mr. Secretary, I have been informed that as a result of that cessation of the contract at this point in time, it is going to cost an extra $200 million as it relates to a startup. Is that true?

Mr. WELCH. No, sir.

Senator D'AMATO. My guy here is furiously writing notes.

Mr. WELCH. No, sir.

Senator D'AMATO. There is no request in the fiscal year 1992 by the Air Force for that?

Mr. WELCH. Sir, first let me address your question. I believe that is a number submitted by the contractor, and we would not accept that number as either accurate or something we would contract to.

The second thing that I would say is that the history of funding for completing the funding to the $20.5 billion base for the B-1 program is not a pretty one. We do not believe we have had, as I said earlier today, that $20.5 billion. If it were funded up to that ceiling, we would, in fact, have the funds to complete that.

When the availability of merged accounts and others came to us as a given, we were not able to recommend in the budget that is over here for consideration being able to put that money in the budget. To date this year, we have not been able to show how we can connect the moneys required in the short term here to be able to keep that program going, and we simply ran out of money.

Senator D'AMATO. Mr. Chairman, I indicated that I was going to ask one question and this is really a continuation, because I did not think we would get into it like this.

I have a little article here, Mr. Secretary, in Defense News, April 8, 1991. It has got the general's bar mitzvah picture here.

General CROKER. I can see why you are a Senator, sir.

Senator D'AMATO. It goes on to say:

> Croker said Air Force suspension of the B–1B procurement plans would cause at least a 1-year delay in service efforts to correct the bomber's deficiencies. He also said that the cost to correct the ALQ–161 will now increase by at least $170 million.

I said $200 million, but——

Mr. WELCH. Senator D'Amato, let me address this. Senator Croker—"Senator Croker." We have got you up there too, now, Steve.

Senator D'AMATO. He is probably better off where he is. [Laughter.]

Mr. WELCH. We could probably debate that, too, sir.

Senator D'AMATO. Well, I tell you, nobody is attacking him. [Laughter.]

Mr. WELCH. I think that was reporting exactly the same number. We are all talking about the same number.

Senator D'AMATO. Yes.

Mr. WELCH. That is as proposed by the contractor. I simply do not think we would proceed in that direction. That is all I am saying. I am not suggesting the contractor does not know what it would cost for him to do it the way he would like to do it. I am simply saying we would not propose to do it that way.

Senator D'AMATO. What would you do? If the contractor says to you, "Mr. Secretary, look, my startup costs on this are *x* number of dollars.

He says, "$200 million."

You say, "No; we are not going to give you $200 million."

He says, "Well, what are you going to give us?"

I mean, you are not going to tell me that you are just going to walk down the street and find Mr. Dipsy-Doodle or take over General Dynamics or XYZ contractor. You just cannot pick that up and start running with it. There is some cost attendant.

Now, you may disagree with the $200 million. General Croker says $170 million. It is an increased cost, though, and it is going to be a substantial one.

Mr. WELCH. Yes, sir; but I do not think it is going to be that order of magnitude. And when you have no money to expend on the program, it does not matter what the cost is. You cannot spend.

Senator D'AMATO. Well then, let me go back to this. I will be accused of parochial interest, but let us take a look at it. I am accused of everything else.

The core upgrade, as General Chain testified and as you have just said, was essential if the B–1B is to be a viable penetrating bomber. Now look, if it is essential, then how the hell do you drop the plan?

Mr. WELCH. Sir, we did not drop the plan. I suggest to you——

Senator D'AMATO. No; you just suspended it.

Mr. WELCH. We did not suspend the plan. What we did was run out of money, and I would suggest that General Chain is exactly right.

Senator D'AMATO. General Chain?

Mr. WELCH. General Chain's words are exactly right. But I would tell you the antideficiency legislation that says we cannot commit money we do not have to spend is an equally powerful influence on me.

Senator D'AMATO. Well, I can see a powerful catch 22.

Mr. WELCH. You have it exactly, sir. We agree with you that the funding of the ALQ–161 is a very great catch 22. You know, I would point out to you that we were proceeding on a correction of defects element of that contract, so the contractor, in fact, was correcting his defects, partially with his own money.

In fact, financially he will very likely be better off without that contract. So we look to contract performance as the first priority to get something done and changes as a lesser priority by far. We would ask, perhaps, the Congress why they chose to limit the funding over the past 2 years so that we, in fact, were not able to fund that contract.

By the way, I would point out that it is not a few million dollars a month or whatever. It is several hundred million dollars to go over a period of about 3 years. So it is quite a significant task.

We, like the contractor and, hopefully, like the testers, believe we have an answer to give the performance that General Chain said was essential.

General CROKER. Sir, the Congress put in its statement that we had to have a zero concurrency program, that we had to complete all the testing, not just the development testing to see that the contractor did his job, but also the operational testing, and we had to have an independent report by IDA before we could proceed with production.

Now, the problem was that when the airplane was grounded, as Senator Bumpers described, we lost those several months of tests. And as Mr. Welch said, we ran out of money. Now, we would have preferred not to stop, but we literally ran out of funds and did not have replacement moneys and, in fact, we still have not completed the test assessment.

So even if we had the money, we are not yet permitted to go ahead with production until we and you rule that the test results are satisfactory, not just the development tests but also the operational tests. And that has not occurred yet.

ALQ–161 REPROGRAMMING

Senator D'AMATO. Well, I have brought this about as far as I think we can at this time. But it does not seem to me it is a good way to run a business. It is a very poor way. It is certainly going to result in taxpayers paying more money.

If indeed it is the essential ingredient that the core upgrade be undertaken if we are going to have the plane perform its task, then it seems to me that the Air Force should have looked for reprogramming to get these funds. Now, if you are telling me that there are other areas that are more important, fine. In essence, it would seem to me that that is what you are saying, that we decided that at this point in time we would not move forward.

You did not ask for a reprogramming, and I understand a reprogramming in a tight fiscal time means that other programs have to be sacrificed. Those are decisions that you have to make. But would you not have come forth with a reprogramming?

General CROKER. Sir, we were in the process of doing that when the money ran out. It took us on the ATF last year 6 months and 30 tries to reprogram a far lesser amount. So we were actually in the process of doing that when the time and money ran out.

Senator D'AMATO. Well, are you going to ask for a reprogramming this year? I mean, what are you going to do with this program? Are you just going to let it—how long will it be terminated?

Mr. WELCH. It will be terminated at least until midsummer of this year, because by congressional direction and agreement we would be in no position to fund the program because we must have a certification from the Secretary of Defense, from the operational tester, and others before we are permitted to agree with our own test results and present them for consideration.

I think that in prior testimony the Air Force has said at that time they will try to identify those funds, whether it be a reprogramming or new funds, and, in fact, go on, because it is our desire and our need to get the ALQ-161 properly operating in the B-1.

Senator D'AMATO. Thank you very much, Mr. Secretary.

Thank you, Mr. Chairman.

Senator INOUYE. Thank you.

I think in fairness to the Air Force it should be noted that, as Secretary Welch pointed out, DOD would not permit you to use funds from other sources. We in the Congress have also made it very difficult for you to have funds available.

So you have got a big hurdle to go over.

Senator D'AMATO. I do not know how they are going to get there. I leave it to the chairman to help. [Laughter.]

Senator INOUYE. Senator Specter.

Senator SPECTER. Thank you, Mr. Chairman.

I regret that I cannot stay long enough at this juncture to have a series of questions and answers because, while I had been here earlier and there had been extensive questions, Judiciary is now in process. I have just told the chairman and I excused myself to go to Judiciary, where they are now considering the nomination of Judge Ryskamp, which I have to be present for.

NEED FOR B-2

But I have a series of questions which I would like to submit for the record, and would like to just say a word or two about some of the main concerns I have about so much money for this strategic weapon in the context where, as I understand it, the single integrated operational plan has not been revised since late 1989.

The concern that I have is all this money on a strategic weapon where there have been enormous shifts in the Soviet threat since the SIOP plan was last promulgated, and this is especially in the context of a limited budget where we have heavy competition with, say, the V–22 Osprey or the carrier fleet, just to mention two issues.

I would like an extensive response in writing as to why we need the B–2 without having a reevaluation of the SIOP, at least that I have seen, in light of the shifting Warsaw Pact threat and the shifting Soviet threat.

[The information follows:]

NEED FOR B–2 WITHOUT REEVALUATION

There has been a re-evaluation of the B–2 based on the threat. The Secretary of Defense ordered a thorough scrub of B–2 requirements during the Major Aircraft Review [MAR]. The number of B–2s required was reduced in part due to the reduction of target base with the disintegration of the Warsaw Pact. The Defense Intelligence community continually reassesses the threat posed by the Soviet Union. The Warsaw Pact is no longer militarily viable. This considerably reduces the chance of a ground conflict in Western Europe. The impact of this to the Soviets is the elimination of the Eastern European "Buffer Zone" that was central to their foreign policy since 1945.

The one thing that has not changed for the better since the deterioration of the Eastern European military threat has been the status of the Soviet's strategic arsenal. In spite of the severe economic hardships in the Soviet Union, they continue to improve their ICBM, SLBM and manned bomber programs. The Major Aircraft Review decision was based upon a valid threat and target base that supported the procurement of 75 aircraft. This decision is still valid.

TARGETING MOBILE ICBM'S

Senator SPECTER. A second question which is very much on my mind concerns a major purpose of the B–2 to target mobile ICBM's, in light of the difficulty which we have had in the gulf war on finding the Scud missiles. If you have something that is mobile and have a very limited timeframe, what is the expectation as to success on that major operational approach?

[The information follows:]

TARGETING MOBILE ICBM'S

The difficulty in finding SCUDs in the Middle East has emphasized the difficulty in attacking mobile targets; however, this has not changed the position regarding the B–2. The primary mission of the B–2 is not, nor has it ever been, mobile missile launcher. The B–2 does however provide the best longer term hope to hold both strategic and conventional relocatable targets at risk. When it becomes operational, the B–2 will inherently have a much improved capability (specifically in the areas of range, loiter time, combat altitude, survivability, and payload) over current platforms, and as mobile target detection technology matures, future upgrades and improvements will greatly enhance its effectiveness.

Senator SPECTER. The cost factor has been inquired into by others. Some of my questions reach that, and the general approach on having the craft tested before it is purchased, so-called fly before buy, et cetera, also is very much on my mind.

As I said, I had been here earlier, because this is a very difficult issue for the Senate this year. I supported the compromise last year and was one of the last to make a decision, and I want to accord the administration full latitude and opportunity to have these issues confronted. But these questions I think are very major ones.

I would much prefer to be able to stay and have a dialog and pursue it, but I am not divisible, so I have to go to Judiciary.

Mr. WELCH. Senator Specter, we would be happy to take it for the record. Also, at a time when you are a bit more available we would be very happy to come over and address them. I think they lend themselves to some discussion as well as a written response.

Senator **SPECTER**. I appreciate that offer. Let me see the written responses and we will consider a meeting as well.

Thank you.

CONTRACTOR PROBLEM STATUS

Senator **INOUYE**. Mr. Secretary, last year the Air Force advised this committee that there were problems in six management areas in the prime contractor, and I think you listed them down as systems engineering, transition to production, software management, subcontractor management, organization personnel, and business systems.

What is the latest status?

Mr. **WELCH**. I think that it is a good news story this year I can bring you. It is not a complete story yet, but it is a good news story. I think that really was one of the elements that I was addressing myself to the contractor in the letter that was referenced earlier to Mr. Kressa. We felt that there was significant improvements needed in the way that they did business.

I think it is important to say at this time what we now know, if we look particularly at B–1, B–2, and I think we will see it some in ATF and all, is we do not have a continuity of business in any given corporation these days. We sort of go up and down, because we have so few new starts.

We need to recognize that there is a learning curve in that process and the adoption really of good business practice in there. We are going to need to leave time and, in fact, make plans for that.

That did not happen in the B–2. I think we moved into it directly. We did not have the proper appreciation of how long it takes to get employees cleared, as a matter of fact, to work on programs like this, or how long to bring on the work force. We were trying for the first time to do a full-scale development program with the hard tooling.

I think that they had great difficulty. We were trying to manage to the cost schedule control system that is very difficult to certify with a corporation and that takes a very powerful discipline to report against.

What we needed really was the management attention to get those systems in, to get them certified, and have both of us to have confidence that they were good management. We have a certified CSC system now that has had two visits and I would tell you is approaching the level of confidence we should all have to measure program progress, and that is our key management tool in terms of looking at it.

We were looking at the application of technology typically, as we always do, is to focus on, perhaps, the aircraft we were working at the time and not have apportioned the amount of time to look at the fact that we have got a No. 2 and a No. 3 and a transition to production.

We have a good transition to production plan right now. The elements are identified and we think we have a good metric to measure progress. We are not yet satisfied, though, that we have, in fact, the elements there to make it real. We spoke to that a little bit earlier in the hearing and the question of missing some of the plans that you have heard about.

We have budgeted differently than we have contracted, and rightly so, to try to protect that room. We would like to close that gap. We see the ability to meet cost and schedule significantly improved.

We did not have what I would consider a technical performance problem over this time period. So it was a matter of capturing and getting into production, to get that scrap, rework, and repair down, to get the installations right the first time, and to make sure that the aircraft, in fact, could be delivered on schedule.

So that was the overall aspect that we divided into the six areas, as you know, and I believe significant improvement has been made this year. We have confidence on the transition to production now. I think we need to improve on our visibility, both the corporation and the Government, with respect to making it happen. So the making it happen part is the to-go. We believe the process items are in place.

Senator INOUYE. Are you satisfied with the response of the prime contractor?

Mr. WELCH. Yes, sir; I am. There have been many changes in this process and for many different reasons. But I would tell you today I believe he has a management team in place on the B–2 program that we have confidence in and that we would expect performance from.

B–2 PLAN

Senator INOUYE. I believe you are correct, Mr. Secretary, in noting that from the very outset the B–2 was designed to perform conventional missions in addition to nuclear deterrence. Are you now trying to enhance this or accelerate this or improve upon it?

What is the present plan?

Mr. WELCH. Well, I think the present plan is best captured by trying to learn from all those things that we saw in Desert Shield/Desert Storm. We did not have an environment like that before, where we could get some actual measurements. I think the best description with respect to the conventional capability of the B–2 is to take advantage of what I will call the architecture of the aircraft anyway.

It has a modern electrical distribution, control and distribution system, so that it can accept all of the modern weapons that we built in from day one and I think that was good foresight.

Now we have had an evolution of weapons that we have had an opportunity to test. So it is capturing the additional conventional capability that we think will enhance this aircraft, and I think that is what we have been trying to say over the past few weeks. There have been various quotations, but it will be to take those lessons learned in Desert Shield and find their applications to the conventional capability of the B–2.

Senator INOUYE. So you are not in any way diminishing the nuclear deterrence mission, are you?

Mr. WELCH. No, sir; in fact, I hope that I left with you in opening discussion and making, frankly, a single chart in this book that we gave you, the mission, the No. 1 mission, is nuclear deterrence. We are not diminishing that at all and, in fact, that is what we will deliver with the first aircraft.

We are talking about other capabilities that perhaps were strung out a bit in series we may be able to bring on line in parallel.

B-2 WEAPONS

Senator INOUYE. Within the limits of classification, can you tell us what types of weapons, conventional weapons, the B-2 has been——

Mr. WELCH. There is a chart.

Steve, you might find the page for me.

But I would tell you that I think again, if you look on page 34, there is an inventory of those weapons that we have addressed ourselves so far to and that are built into the baseline of the B-2 today.

I think that it is obvious to us, and I am sure it was in your visit over there, the value of precision-guided munitions when coupled with a good platform and a good crew. So I think you would see our focus in the precision guidance area and certainly what I think has been sort of generically talked about as the near-zero CEP type of weapon.

Senator INOUYE. According to these numbers, are you saying that the B-2 will be able to carry 80 MK-82's?

Mr. WELCH. Eighty Mark 82's are physically what the aircraft can carry and deliver.

Senator INOUYE. And this is all internal?

Mr. WELCH. Yes; it is all internal. For reference, you can carry, I believe, 50 or 51 in the B-52. So we talk about some improvements even over the good old B-52 both in payload as well as in range.

Senator INOUYE. Do you anticipate any added cost to the B-2 as a result of lessons learned in Desert Storm?

Mr. WELCH. Well, if we add to the capability certainly we would have to pay for it. But I think a baseline that you might consider is, as you go through the weapons that are listed, the conventional systems that are listed in this page, you should expect that that capability would be delivered within the cost proposals and the budget requests that we are making here.

We would have to address individual weapons as you go on. My sense, though, is that we do not see any of the newer weapons that are incompatible with the architecture of the air vehicle. If you get an incompatibility there, you then have got to begin to dig deeper into the air vehicle and go into block changes, electrical and all. We do not see that in order to be able to accommodate some of the newer weapons.

B-2 TECHNICAL PROBLEMS

Senator INOUYE. I have many other technical questions, but I would like to ask this last one because of some of my colleagues' concern. In the flight tests, the Air Force has identified three areas: first, aft deck cracks; second, rudder closure at high speed; and third, elevon trim out of low-observable tolerance.

Have you done anything about these?

Mr. WELCH. Yes, sir; I think I would suggest you have actually listed them in order of challenge, also. If I might start at the bottom, the elevon trim situation, what we are seeing is as the surface or control surface breaks the overall contour of the wing in trim we are getting it higher than we would desire from a low-observable standpoint.

We think we have a fairly straightforward answer for that, that we know the answer now, and we will put it into flight tests as far as some shaping. I think that one is pretty straightforward.

The rudder, as far as the strength situation there, it is one of those things I think we will always find in flight tests. We just missed the loads on that. So we will have to return to the wind tunnel and I think we will have more than one fix. But I think it is straightforward and it will be introduced in the flight tests and I see no problem with that.

And I do not know the exact dates. We have exact dates for installation on the aircraft as well as flight tests for those two items. I would put those in the idea of kind of the reasons you do tests.

Now, the aft deck situation is quite different. If you look, and you have seen the aircraft, the aft deck is where we have got high-temperature exhausts. We have got a high-temperature environment, we have got an air flow environment, and we have got a high-acoustic environment.

When we started the B–2 program, we simply did not have the analytical tools to do the necessary analysis in that area, and as such we missed the loads and the temperatures. A little side story: Already from the national aerospace program, some of the computational fluid mechanics algorithms that are coming out there we have actually been applying to the B–2 here now. So we are seeing a throwoff from a different technology program.

It is a durability problem; it is not a strength problem. So the first thing on these cracks is we know how to control them. We know how to put a patch on so that we can continue flight tests, not only from a safety of flight standpoint but also from a signature standpoint.

Over the 10,000-hour life of the aircraft, we would not want to be changing that deck out. So we are going very carefully with respect to analysis to make sure that we get a fix that will, in fact, go on there and stay on in a durable fashion over that time period.

I believe it will be this coming summer before we settle in on one that we really like. We have four that we thought offered promise. We have evaluated them, including test coupons. We have got two that we will stay with until summer of this year. I would say by the late summer of this year we can come and tell you exactly when that would be complete and, in fact, how much it is going to cost.

But again, it is durability, but I would tell you that that will not be something that is easy or inexpensive. So we look forward to that in the outyears. But it is a replacement type of thing; it is not something that we would introduce into production probably at some period during the production program, and then you would look to a replacement at some time where you were going through depot in the natural time period of the program. But it is a tough problem.

Senator INOUYE. They are tough, but not insurmountable.

Mr. WELCH. No, sir; no show-stopper. It is just how long will the fix last, never did we have one available.

Senator INOUYE. All in all, would you say that we are on schedule and you are satisfied?

Mr. WELCH. Sir, I believe that we really are on schedule, and I do not think we should ever say that we are satisfied. We have got a tough challenge. I frankly would like to see more productivity out of the test program, getting more data faster, et cetera, and I think that is possible. And I think those are the kind of challenges we have for calendar year 1991, to continue to improve on that process so we get on with it a little bit faster, yet get the same quality of data we can report to you so you can have the same confidence we do.

Senator INOUYE. Mr. Secretary, General, on behalf of the committee I thank you very much for your presence today. Your testimony has been extremely helpful. I will be submitting a few more questions. I hope you look them over.

ADDITIONAL COMMITTEE QUESTIONS

[CLERK'S NOTE.—Additional questions submitted by subcommittee members, together with the Department's responses, will appear in the appendix portion of the hearings.]

SUBCOMMITTEE RECESS

Senator INOUYE. We will stand in recess until April 16. At that time, we will review the Army's armored systems modernization program.

[Whereupon, at 11:30 a.m., Thursday, April 11, the subcommittee was recessed, to reconvene at 9 a.m., Tuesday, April 16.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1992

TUESDAY, APRIL 16, 1991

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9:05 a.m., in room SD–124, Dirksen Senate Office Building, Hon. Daniel K. Inouye (chairman) presiding.

Present: Senators Inouye, Stevens, and D'Amato.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

ARMORED SYSTEMS MODERNIZATION

STATEMENT OF HON. STEPHEN K. CONVER, ASSISTANT SECRETARY OF THE ARMY (RESEARCH, DEVELOPMENT, AND ACQUISITION)

ACCOMPANIED BY MAJ. GEN. PETER M. McVEY, PROGRAM EXECUTIVE OFFICER FOR ARMORED SYSTEMS MODERNIZATION PROGRAM

OPENING STATEMENT OF SENATOR INOUYE

Senator INOUYE. This morning the Subcommittee on Defense Appropriations will receive testimony from the Army on the Army's Armored Systems Modernization Program.

Before we review the Army's plans for equipping the future forces, on behalf of the subcommittee I would like to take this opportunity to congratulate the Army on its current generation of armored systems and their capabilities so masterfully showcased during Operation Desert Storm.

All indications are that the M–1A1 tank and the Bradley fighting vehicle have performed superbly and exceeded not only the expectation of its supporters, but apparently has muted their critics of the level of readiness and effectiveness of these systems.

We are now entering a new era where we must draw down on the size of our forces. Changes in the form of threats to our national security as well as budget constraints are taking us down a path we have traveled before.

However, in previous times we ended up with a hollow force as a result of too few troops, inadequate training, and poor quality weapon systems. We cannot avoid troop reductions, nor are they necessarily bad if properly managed.

Based on our experience in the Persian Gulf, everyone is also acutely aware of the critical role that training plays in concluding a hollow force, but the most difficult facet of force readiness is the ability to maintain and continue to field modern equipment. The searing memory of the hollow forces of the 1970's will not be soon forgotten by this committee.

In pursuing the modernization of its armored systems, the Army is concentrating the core of its efforts on the development of a common chassis and common modular components such as transmissions, engines, and axles. If successful, this will lead to greatly reduced maintenance and logistic support costs once the systems are fielded. By no means is this an easy task.

Several issues must be actively resolved before the Army can proceed toward full-scale production and fielding of these systems. First and foremost is to ensure that this program is maintained on schedule and within cost. With current fielding predictions running out well beyond the year 2000 and with costs already estimated at over $55 billion, the current armored systems modernization is very ambitious and appears to leave little room for error.

Also a factor is the concurrent development and fielding of the Army's light helicopter. Together the feeling of new armored systems and the LH will comprise sizable portions of the Army's investment program over the next 20 years. So this subcommittee must weigh this commitment of resources against the potential detriment to other systems that will occur if the Army focuses too narrowly on these programs.

So I am concerned that the Army may find itself either deferring development in fielding of other critical systems or cutting back on planned quantities of its armored systems.

The Army also faces the issue of capability tradeoffs. The Army must consider the weight of its weapon systems versus desired survivability versus ease of transportability of the systems in question.

Finally, we must assess the threat against which these systems are being deployed, developed. Changing threats have as much of an impact on the fielding of a system as the maturity of the technology involved and the funding available to field the system.

The threats faced a few years ago when the Armored Systems Modernization Program started to gather momentum are vastly different than those encountered today. The issues we face today and act upon will affect the profile of the Army for years to come.

Before I call upon my witnesses, I would like to call upon the vice chairman of this subcommittee, Senator Stevens of Alaska.

Senator STEVENS. Mr. Chairman, I have no opening statement. Thank you very much.

Senator INOUYE. Senator D'Amato, do you have a statement?

Senator D'AMATO. I would simply like to join you in the observations you made as it relates to the manner in which our armored forces performed. They certainly did, I think, allay many of the fears and quiet many of the critics.

Senator INOUYE. I thank you, sir. Our witnesses this morning are the Honorable Steve Conver, Assistant Secretary of the Army for Research, Development, and Acquisition, and Maj. Gen. Pete McVey, the Program Executive Officer for Armored Systems Modernization. Gentlemen, we welcome you this morning.

We have received your statements and reviewed them, and without objection your full statement will be made a part of the record. You may proceed as you wish, sir.

SUMMARY STATEMENT OF MR. CONVER

Mr. CONVER. Thank you, Mr. Chairman. With your permission General McVey and I would both like to make some brief opening remarks, after which we would be delighted to entertain your questions.

I would like to thank you for your kind words about the performance of our weapon systems in Southwest Asia. We are quite pleased with that. There are some problems. Obviously everything did not work perfectly but, frankly, we have had to look fairly hard to find fault with the performance of our systems. The reliability, the lethality, the maneuverability of the forces have all met or exceeded our expectations and certainly those of the public.

Also, Mr. Chairman, I would add that none of the performance of these systems in Southwest Asia would have been possible without the consistent support of the committee and subcommittee over the past 20 years. Because these systems were made possible by research and development that occurred in the 1970's and by procurement that occurred during the 1980's, and without your consistent, continuous support over that time period we simply would not have been able to achieve the results we did.

Turning now to the issue of ASM and, somewhat more broadly, the Army acquisition budget, I would like to make a couple observations, much of this you may know, the Army is doing a pretty good job of funding our research and development activities, even though the funding is at a relatively modest level compared to the other services. We are running at about $6 billion a year in RDT&E. We are protecting the RDT&E accounts. We are not taking cuts out of RDT&E.

We are not so fortunate in the procurement accounts by virtue of the top-line reductions in the total Army funding. The Army has been forced to take very large cuts in procurement. Just in the past 2 years between the fiscal years 1990 and 1992 budgets our procurement account has dropped from over $14 billion to about $8 billion in procurement budget. Today the Army receives in the 1992 budget that is before you, only about 13 cents out of every $1 in DOD procurement.

As you know, our big 5 weapon systems, the Abrams, the Bradley, the Apache, the Black Hawk, and the Patriot, all are on the verge of going out of production. And this represents, I guess, an opportunity for the Army to save some money, but it also represents a bit of a threat when you get to a position where you no longer have major weapon systems in production. And that is basically the situation that we in the Army find ourselves in today.

If you look on the list of top 20 DOD programs, you will only find three Army programs and they are all below the level of No. 13 or 14, I believe, at this point. Looking at our procurement funding and comparing it to what it used to be at the height of the defense buildup in about the 1985 period, we have lost 64 percent of our purchasing power since 1985 in the procurement accounts for the Army.

So I will tell you, as the keeper of the Army's acquisition funds, I personally feel that our ability to modernize is very seriously threatened by the very significant reductions that we have been forced to take in the procurement accounts.

Now, why has the Army done this? I will tell you that it has not been done willingly or enthusiastically, but when you look at the Army's priorities, as you mentioned in your opening remarks, Mr. Chairman, the Army's first priority has been to prevent the hollow forces that we all labored under a decade ago. We are, first and foremost, going to avoid having hollow forces, so the first priority is to make sure that the forces we have are ready and are able to fight if they are called upon to do so.

As I mentioned a second ago, we are also trying to protect R&D, albeit at a fairly modest level. Now, in the recent past, I think there has been a criticism of the Army that we have tried to protect force structure and we have sacrificed other things like procurement in the interest of trying to protect force structure. While that may or may not have been true in the past, I can tell you it is most assuredly not true now because the Army has committed to reduce the size of the force from 780,000 troops that we have today to about 535,000 troops at the end of the future years' defense plan. The 6-year period in 1997, we will be down to about two-thirds of the current level of force structure.

So even in the face of all of that, it has not been possible to protect the procurement accounts. And we put a brave face on that and we talk about our willingness to accept near- and mid-term risk, but the fact remains that our procurement account has been taken down very, very significantly to a level that I personally believe threatens our ability to modernize in the future.

The problems with the approach that we have been forced to take within our procurement accounts are at least fourfold. I guess the first problem is that we are ruining our military capability. If we go for a period of 5 or 6 years without procuring major items of equipment, we are basically in the posture where we have another Desert Storm in a decade. For now we will be fighting that same war with the exact same equipment, unimproved equipment that we used to good effect in the current Desert Storm.

Second, I think when we take these big cuts in procurement, we send a very bad message to you in Congress that are trying to support us; that is, when we take big cuts in procurement every year the procurement budget we send over to you looks different than the one we sent over to you the previous year. And the message that we are sending to you is one of inconsistency and perhaps even a lack of commitment.

I would like to personally assure you that it is not a lack of commitment, it is simply a lack of money, and you would see greater continuity from year to year in our procurement budgets if we simply did not have to take these large cuts in procurement.

Third, and I know it is a subject of great interest to the committee. When you take your procurement budget down that far, there are significant industrial base impacts. Right now we are looking at serious industrial base impacts in the armor area. Because, with the prospective termination of the M–1 tank line, and in the absence of a tank upgrade program, the tank industrial base will certainly play itself out. We seriously have to question if that base will be there when we attempt to go back around the turn of the century and buy the new systems under the ASM Program that we are going to talk about today. Will the industrial base be there?

We can limp along with foreign military sales, but that is not enough to do the job. Some facilities, for example, the DOE special armored facility, stands to go out of business. So that is a capability, an industrial base capability that has the potential of going away completely.

Finally, I guess we just face the budgeting crisis, that once you let your procurement get down that low, how do you ever get it back up again, and what are the conditions that are going to enable us to get from a level of $8 billion in our procurement account now up to a level in excess of $10 billion that we think may be required to support both the LH and the ASM? And I know you mentioned that in your statement and we share your concern on that.

We think we have in our budgeting documents now the money to do that, but I will tell you it is very, very tight, and we are concerned about our ability to get those procurement dollars back up to a level where we can resume buying major items of equipment for the Army.

I would like to just say a few words about the ASM Program. And shown here on the chart on your right and also on a piece of paper in front of you are six of the seven armored systems modernization vehicles. I would like to just say a few brief words to describe and introduce those systems. Then I would like to ask General McVey to talk to you very briefly about how those six vehicles would be used in an operational context and the level of improvement that those systems represent over the current items of equipment and why we need the new systems.

The ASM Program consists essentially of the six vehicles. Four of the vehicles will use heavy protection level chassis. Of course, the Block III tank, which I guess you are all familiar with, is a new generation tank. The advance field artillery system, or AFAS, will replace some of the current artillery systems and augment artillery systems in the fleet. And, as you know, we are doing the howitzer improvement program [HIP]. We will not get rid of those, but the AFAS will fill a very substantial void in artillery capability.

We have the future infantry fighting vehicle, or FIFV, which is a follow-on to the Bradley. And we have a combat mobility vehicle, which we certainly wish we would have had in Desert Storm to clear those mines and provide a counterobstacle capability and so forth.

Those are the four heavy protection level chassis vehicles. The two medium protection level chassis vehicles we have are the future armored resupply vehicle for ammunition, or FARV–A, and the line-of-sight antitank, or LOSAT, vehicle. Those are both mounted on medium protection level chassis.

In addition to those six systems we have another system that we also include under the auspices of the ASM Program, and that is the armored gun system, or AGS, which is a replacement for the Sheridan light armored vehicle that is currently used by the 18th Airborne Corps.

A couple of points about these, Mr. Chairman. We have already discussed, a moment ago, the issue of affordability. We are concerned about our ability to afford both the ASM programs and the LH program. And I will tell you that our ability to do that is very sensitive to maintaining at least the funding we have, and probably we need a little bit more funding to do that on the schedule that we would like.

You mentioned also the common chassis. We are trying to do a common chassis to take advantage of the economies that will accrue to us if we do not have to build a separate chassis for each of the six vehicles that you are looking at. And there is a lot of commonality between the various vehicles based on the common chassis, common architecture, common electronics, common suspension, engines, and so forth.

I think that if we are put in a position where we have to start breaking this program apart and stretching it out, we, indeed, will threaten the benefits that would otherwise accrue to us by being able to do these things more concurrently on a common-chassis basis. So the common chassis is very integral to this concept and it is very dependent upon our ability to have the money to execute the program pretty much on the current schedule.

The order of the systems is something of great interest to the committee. We have listened to you. We understand that there are those who feel that the AFAS, the artillery vehicle, should be accelerated. We have accelerated that to the point where it is virtually concurrent in its development and production with the Block III tank. We do not believe that we can move the AFAS to do it before we do the tank because the tank is the harder chassis and we simply think that the tank has to be done at least concurrently.

We cannot accelerate the AFAS so much that it comes before the tank, but we have listened to you and we think we have approached it simultaneously and we hope that that proposal meets with your approval.

Finally, I would like to make a point, before turning it over to Pete McVey, about the relationship between the Block III tank, which is our new tank, as part of the ASM Program, and the upgrade program. Again, we have listened to the Congress. We are aware of the strong interest that you have in upgrading the existing M–1A1 tank or upgrading the M–1 family of tanks to the M–1A2 configuration.

I will not delude you. This has been a contentious issue in the Army. The history of this is probably known to you. We fought the battle within the Army. We prevailed. And we funded an upgrade program, a very modest upgrade program to upgrade basic M–1 tanks to the M–1A2 configuration.

We put scarce Army resources against this program, submitted it to OSD and, unfortunately, in the OSD review that program did not make the cut. OSD declined to support our request. And so all we can say at this point is that we did make an honest and sincere effort to support the tank upgrade program and it is an issue that I think we will have to continue to relook at each budget cycle to see how much continued effort we want to put against that program.

I will tell you, though, that, faced with the choice, if people on the Congress will play the tank upgrade program against the Block III, the Army invariably will go with the new tank. If they have to make a choice between upgrading older tanks and doing a new one, they will go with the new one every time.

So I think if we are to resurrect this program and make another try next year, it is important that we keep the M–1A2 tank upgrade program separate from that of the ASM Block III tank if we are to retain the support of the users in the Army.

With that, Mr. Chairman, I would like to ask Pete McVey to make a couple of remarks about the ASM family of vehicles and how they would be useful in an operational context in terms of augmenting the capabilities in the current fleet of armored vehicles.

SUMMARY STATEMENT OF GENERAL McVEY

General McVEY. Good morning, Mr. Chairman, and thank you for the opportunity of appearing before the Committee.

The Armored Systems Modernization Program is broken down into current systems and future systems. Those systems shown on the chart are the future systems. I also have responsibility for the Abrams program, the Bradley program, and the armored gun system [AGS]. There is a program manager [PM] that does our armored development work, our antimissile work, some of the technologies that will allow us to reduce the weight and size of vehicles, but maintain the protection levels that we require.

We also would like to echo Mr. Conver's comments and thank the committee for your past support on the Abrams and Bradley system. We are very proud as an Army of the performance of our systems in the Kuwait theater of operations [KTO]. But I think we need to report to you that we have a mobility differential in our existing forces today, the ground forces, and, that is, that the Abrams and the Bradley move cross-country at such rates of speed that the commanders at brigade, division, and corps had to either get themselves into a Bradley or a tank, depending upon whether they are infantry or armored, so they could command and control the operation.

We put a lot of stress on our artillery men because, instead of employing full batteries, they had to split batteries and jump forward to keep up with the rapid pace that the commanders in the field were capable of performing with those systems.

We also put a lot of stress on the logistician because we had to move the spare parts, we had to move the fuel. When moving 200 miles in a 24-hour period, it takes a lot of coordination and a lot of command and control efforts by the commanders. The ground systems that we had, coupled with the Apache, were able to do a very significant job, very fast, take the initiative away from the enemy forces and, therefore, seize them before they had the opportunity to mount any attack.

What we are trying to do with the ASM Program is solve the brigade commander's problem in terms of logistics and mobility. We have built the program to try and eliminate the number of support items in the brigade, the number of mechanics by type that you need in a brigade, the various number of spare parts that are different in the maneuver brigade and the artillery systems.

We are trying to fix a problem with the combat mobility vehicle that the Army currently has. That is, we cannot go through and breach obstacles at a fast rate. We have to use countermine equipment. We have to use plows on current tanks. It is a very slow, laborious process.

In an effort to make sure that we were designing the vehicles right, we have, with each one of the future systems, a master gunner. And I brought one of them with me today, Master Sergeant Benke, who is the master gunner on the advanced field artillery system [AFAS]. Sergeant Benke's job, along with the five others, is to talk to the engineers, talk to the officers, and say this is how we function. This is what we want in the vehicle because the master gunners live in the vehicles. Officers are in and out of them.

So we wanted that perspective. They have paid off in the initial phases of the program superbly. We expect them to continue.

For the future systems, sir, the objective is to build a common-component chassis. With that chassis we think we will reduce the logistic support base. We will have in the vehicle a common propulsion system; that is, engine, transmission, final drive. We will have a common power buss. We will have common suspension. But that does not mean that the common chassis will be all the same.

What it says is that because we have computer-controlled numeric machines currently at Lima, we will have the ability to make the common-component chassis over one production line.

For an artillery system it may have four road wheels, it may be a little taller, it may be a little narrower, it can be configured, but we will have 60-percent common parts in the artillery common chassis and the tank chassis.

Our objective is to be able to go through tests with the common chassis, prove out its reliability, and then work on the mission modules for the six systems, the four heavy protection systems being the Block III tank, the advanced field artillery system, the combat mobility system, and the future infantry vehicle system.

We have gone through this process. We have two contractors working on the common chassis at this point. We have spent 18 months evaluating proposals. We are confident that we can do this. And the reason we need to do this is we need to solve the mobility delta that we currently have in our existing forces. We need to improve the command and control.

We need to have extended range capability. We have proven in the Kuwaiti theater of operations that we could shoot farther than the enemy. We could see better with our night sights. We could move faster. We want to continue to do that for the entire force.

While we believe that, and are very proud of what we accomplished in the KTO, we know that everybody will take lessons learned. Not only will we study what happened, the Soviets and our allies will study what happened.

We know that other people will try and improve their technologies because we now have the significant advantage in technology. The investment that the Chief of Staff has placed on training and placed on the National Training Center and placed on getting quality people and supporting our equipment paid off.

And we know that everybody will study what we have done and we must maintain, one, a technical advantage. Two, we must get synergism that the battlefield provides when you have good communication, good command and control, positive identification of your systems, extended lethality, and good mobility.

And, sir, that is what ASM is trying to do for the Army.

[The joint statement follows:]

JOINT STATEMENT OF HON. STEPHEN K. CONVER AND MAJ. GEN. PETER M. MCVEY

ARMORED SYSTEMS MODERNIZATION

Mr. Chairman, members of the Committee, thank you for inviting me to come before you this morning to discuss our Armored Systems Modernization (ASM) program within the Army. With me today is Major General Peter M. McVey, the Program Executive Officer (PEO) for Armored Systems Modernization (ASM). We have provided you a formal statement entitled, "Equipping the U.S. Army," that reviews the entire research, development, and acquisition fiscal year 1992 budget. We would appreciate it being placed in the record. I also have a few brief remarks on ASM that I would like to make.

ASM is the Army's highest priority effort to modernize our armored forces. It is a family of six new developmental systems, four on a heavy protection level chassis, and two on a medium protection level chassis, which emphasize commonality and modularity within each level. The heavy protection systems are the Block III Tank, the Advanced Field Artillery System (AFAS), the Combat Mobility Vehicle (CMV), and the Future Infantry Fighting Vehicle (FIFV). The chassis for these systems are currently under development. The medium protection systems are the Line-of-Sight Anti-tank (LOSAT) tank killer, and the rearm and resupply vehicle for the new artillery system, the Future Armored Resupply Vehicle—Ammunition (FARV–A). These systems will use modifications of the Bradley and the Multiple Launch Rocket System (MLRS) chassis, respectively.

All six of these systems are designed to meet threats and provide capabilities that our current systems cannot achieve. Our current systems have performed superbly in combat. During the ground combat phase of Desert Storm our armored forces were mobile, lethal, and owned the night. The combination of armor, thermal sights, weapons, and ammunition allowed our systems to be both lethal and survivable. We were able to engage the enemy well beyond his effective range, outsee and destroy him before he was even aware of our presence. Swift victory with minimal casualties was the result.

Our current systems have proven their worth in the test of combat. They are the products of efforts in R&D and the technology base that took place 20 or more years ago. Many of these systems were first funded and developed two decades or more ago. They gave us the technological edge that made the decisive difference between failure or success on the battlefields of Desert Storm. Modernization decisions made over two decades ago were the key to our success in Iraq and Kuwait.

The performance of our weapon systems in Operation Desert Storm has validated many of the issues that have been the underpinnings of our defense didn't make sense to rely upon high technology weaponry. That, in fact, this high technology was more expensive and, therefore, would not be able to be acquired in sufficient numbers to be militarily significant. I think few would now argue that our approach of going for the high technology solution was a wise one. Time and technology do not stand still and we must maintain and preserve our technological superiority.

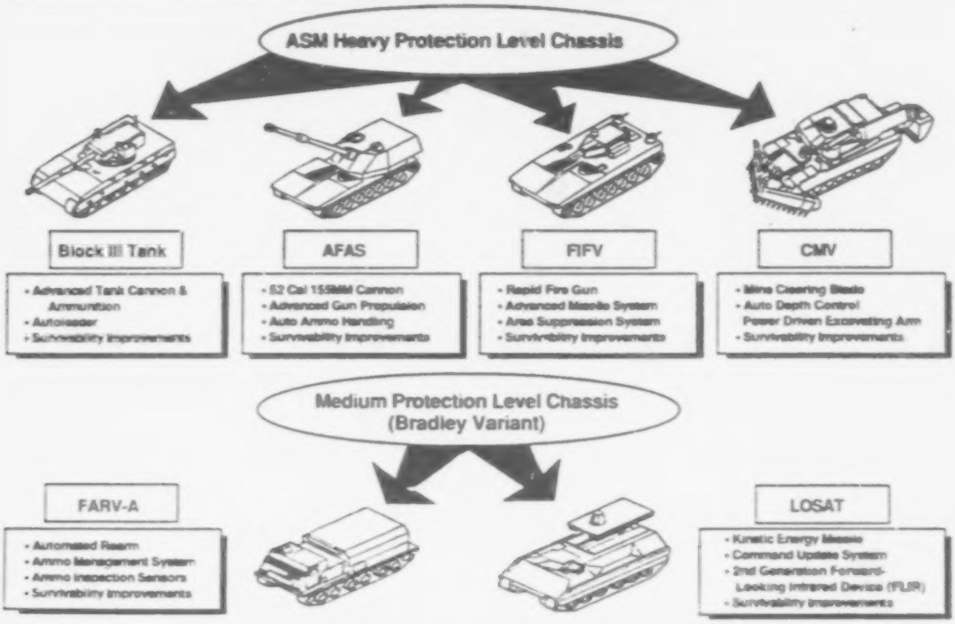
You cannot compare the success of Desert Storm to the battlefield requirements of 2004 and beyond. The threat is evolving and becoming more technologically advanced in all aspects of lethality, protection, and mobility. Lessons learned will be analyzed not only by our side, but by other weapons producers and suppliers as well. Deficiencies will be noted and technologies developed to counter these faults. Not only will we see new systems developed, but existing systems will be upgraded. An example of this is the night vision devices that were found in Khafji, a technology we thought Iraq didn't possess. Technology will not stand still, and with the changing world situation, we must be aware of and be able to defeat all technological capabilities of potential foes who might be armed not only with Soviet equipment, but as Desert Storm Pointed out, with the best of Western technology as well.

The threat of the future is a challenge that our current systems cannot meet. Tomorrow 5 battlefield will see increased firepower, better armor protection, and more advanced target acquisition systems. In addition, these systems will be more widespread due to the proliferation of military technology and international arms sales.

The keys to success on the battlefield of 2004 and beyond are the modernization decisions of today. Just as our success in Operation Desert Storm is attributable to modernization decisions made over a decade ago. These decisions become more important when we consider that we will have to be more efficient and deployable with less, both in systems and in manpower. ASM is designed to allow the future ground combat soldier to defeat and survive against these technological advances of the threat, to aid battlefield management, and to reduce the logistical support required.

Our warfighting doctrine of today and in the future requires agility, freedom of maneuver, and the coordination and integration of firepower from all our combat systems. Our soldiers of the future will need to engage targets with greater accuracy, at longer ranges, and with higher rates of fire using more lethal ordnance. They will need to be able to survive against the advanced technologies of a more lethal and better protected enemy while maintaining the ability to maneuver and resupply under protection on the battlefield.

ARMORED SYSTEMS MODERNIZATION (ASM)
FUTURE SYSTEMS


ASM Heavy Protection Level Chassis
Block III Tank
• Advanced Tank Cannon & Ammunition
• Autoloader
• Survivability Improvements
AFAS
• 52 Cal 155MM Cannon
• Advanced Gun Propulsion
• Auto Ammo Handling
• Survivability Improvements
FIFV
• Rapid Fire Gun
• Advanced Missile System
• Area Suppression System
• Survivability Improvements
CMV
• Mine Clearing Blade
• Auto Depth Control
Power Driven Excavating Arm
• Survivability Improvements
Medium Protection Level Chassis (Bradley Variant)
FARV-A
• Automated Rearm
• Ammo Management System
• Ammo Inspection Sensors
• Survivability Improvements
LOSAT
• Kinetic Energy Missile
• Command Update System
• 2nd Generation Forward-Looking Infrared Device (FLIR)
• Survivability Improvements

The ASM family of systems addresses these critical needs for the future. The Block III Tank will provide significant increases in lethality, fightability, and survivability with reduced weight and lower operation and support costs. This tank of the future will be the centerpiece of the AirLand Battle, as it is today.

The AFAS and FARV–A, which are companion systems, provide the improved indirect fire support that is essential for success in the offense or defense. The AFAS will provide unprecedented fire support with increased accuracy, range, rate of fire, lethality, and survivability. The FARV–A will provide AFAS with the critical capability to quickly and automatically rearm while protecting the crews of both systems from battlefield contamination and enemy artillery.

The CMV will provide the ground forces with a rapid, effective, and survivable obstacle breaching capability necessary to maintain freedom of maneuver. This capability does not exist in the Army today. Our current line charges, grappling hooks, and bayonets are not effective methods of breaching obstacles.

The FIFV will provide our Infantry with significant improvements in lethality and survivability with a fighting vehicle that is capable of maneuvering and surviving on the battlefield with the tank, while delivering a full infantry squad to the battlefront, as dictated in our warfighting doctrine.

Finally, the LOSAT will improve our total force armor killing capability by providing rapid, accurate, long-range, and lethal antitank fires from a highly mobile and survivable platform.

The ASM family of systems will provide the Army armored forces of the future with operationally compatible and integrated hardware capable of overmatching any enemy and successfully executing the doctrinal requirements of AirLand Battle.

ASM, with its six systems, is a research and development effort that focuses on advanced technologies and commonality, resulting in operational enhancements, cost savings in development, production, and support, and operational and support manpower savings.

Commonality is a primary feature of the ASM program. It should be noted that commonality does not necessarily mean identical. Rather, it refers to common development, common production and where appropriate, interchangeable components. Commonality will aid the future battlefield commander in command and control, operations, and logistics. Through the use of commonality we can capitalize on resource savings—time, dollars, and manpower. Concurrent development, common production and interchangeable components will allow us to save research and development, operations, and maintenance resources, while new technologies will meet the requirements of the future force for increased lethality, survivability, supportability, versatility, and deployability, and reduced size, weight and manpower needs of the future force structure. Commonality will be effected through such components as modular armor, propulsion (engine and transmission), track, suspension, vehicle electronics, nuclear, biological and chemical (NBC) protection, computer (software and hardware), as well as smaller items such as gauges, fasteners, material, etc.

The ASM heavy protection level chassis, supporting the Block III Tank, CMV, AFAS, and FIFV is currently under development. The medium protection level systems, LOSAT and FARV–A, will use modifications of the current Bradley and MLRS chassis. Although the chassis will be similar within their level (heavy and medium), they will not be identical for each variant. They will be similar and adaptable, using common components. Commonality serves as a building block for the unique components of each separate system. Although the chassis configuration may not be identical for all variants, their similarity will allow them to be produced on the same assembly line through the use of flexible, numerically controlled machinery.

Technologies that are being developed for application to ASM systems include new advances in armor protection; propulsion; suspension; data and electronics distribution and processing; identification of friend or foe (IFF); fire controls, target acquisition, and weaponry; countermeasures; nuclear, biological,and chemical (NBC) protection; obstacle reduction; autoloaded weaponry; signature reduction; as well as embedded logistics and training.

One area of research and development that is key to ASM is the integrated databuss architecture. The fully integrated and modular electronics will be smaller, enhance survivability with back-up and redundancy, be less expensive, and decrease logistics requirements.

Another modular application will be armor. The armor will be an array of advanced materials, such as composites and ceramics, that will be easily replaceable, facilitating battle damage repair, and easy upgrading to counter future threat developments.

Advances in propulsion are being developed. Currently two separate propulsion systems are being developed as part of the heavy protection level chassis development, one system is a turbine while the other is a diesel. Both will significantly reduce volume within the vehicle and cut fuel consumption in half, thus reducing cost and logistics support.

New advances in weaponry are also being developed for the ASM systems which will increase the lethality, rate, range, and accuracy of fire. The Advanced Tank Cannon System (ATACS), is the current main gun candidate for the Block III Tank. It will have the flexibility to accommodate various calibers through only a tube change. It will be able to fire the current 120 mm munitions as well as the new, much more lethal 140 mm munitions that are part of an international cooperative effort. In addition, it can even adjust to a 155 mm munition, if dictated by the threat. The ATACS has the added benefit of being capable of accommodating redesign to Electrothermal-Chemical (ETC) configuration if that technology becomes feasible for tank application in the future. Artillery improvements include a new cannon using a new propellant. Unicharge, a modular solid charge, and liquid propellant are currently being assessed for application. LOSAT will use the Kinetic Energy Missile (KEM) that is capable of destroying any known or projected armor.

Autoloaders are being developed for the Block III Tank, the artillery vehicle, AFAS, and LOSAT. They will allow a more rapid rate of fire. In the Block III Tank and AFAS, the autoloader will reduce the crew by one, thus effecting a manpower savings while increasing firepower.

Fire control and target acquisition will be integrated, using multiple sensors, such as millimeter wave radar and advanced infrared imaging sights. Countermeasure techniques will be tied to multiple sensors as well, increasing their efficiency. They will be tied to sensors that categorize the type of threat, e.g., lasers, millimeter wave radar, etc., and deploy appropriate countermeasures, such as jamming, obscurants, and counterfire. This will greatly enhance sensor effectiveness and provide quantum improvements in protection.

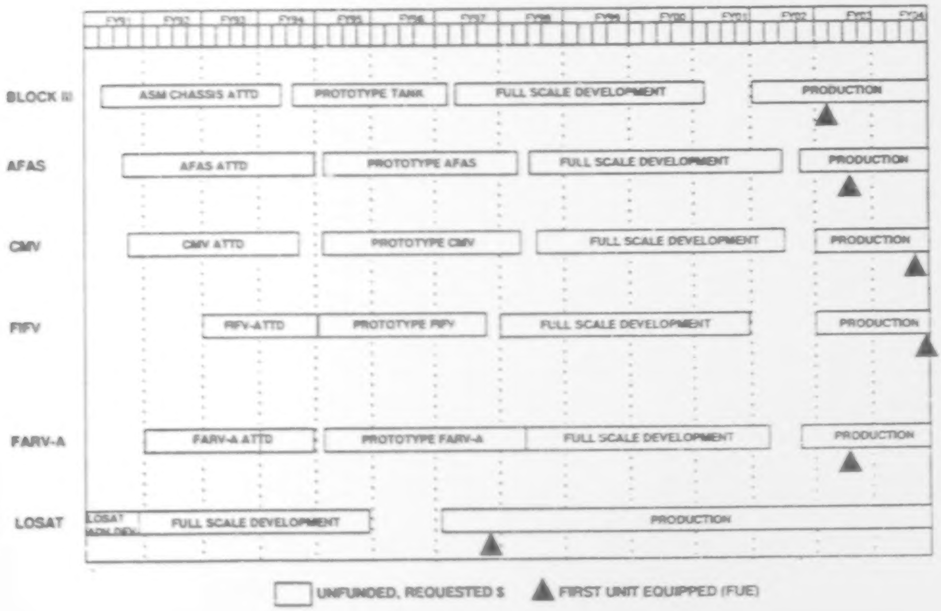
Counter-obstacle developments will focus on a survivable mine clearing blade with automatic depth control and a power driven excavating arm. The development and integration of these technologies will provide the combat soldier the capability to rapidly defeat battlefield obstacles under the protection of armor. Technologies in automated rearm, ammunition handling, and inspection as well as automated remote docking will allow the FARV–A to support the armored units by rapidly rearming under armor in any environment, including a chemical battlefield. Ability to perform on a contaminated battlefield was a major concern of the commanders in Operation Desert Storm.

Two key elements supporting the ASM research and development effort are the Component Advanced Technology Test Bed (CATTB) and the Common Chassis Advanced Technology Transition Demonstrator (CCATTD).

The purpose of the Component Advanced Technology Test Bed (CATTB) is to demonstrate such emerging combat vehicle technologies as vetronics, signature reduction, advanced cannon, etc., through the integration of advanced systems and components. Although the near term application is for ASM, many of the technologies developed and matured here will be applicable to other future combat vehicles. Over 20 contractor teams and the majority of the Army laboratories and research centers are working together on the CATTB to prove technologies and reduce risk. Two demonstrations are planned. In late 1991 automotive and signature reduction technologies will be demonstrated, while lethality and operational capabilities will be demonstrated in mid fiscal year 1993.

The Common Chassis Advanced Technology Transition Demonstration (CCATTD) is another key element of the ASM research and development effort. The CCATTD is the ASM heavy variant chassis development initiative. Two contractor teams are designing and fabricating a heavy protection level chassis to be demonstrated in fiscal year 1994 for use by the Block III Tank, AFAS, CMV, and FIFV. One of these two teams will be selected to provide the chassis for the ASM heavy variant systems prototype development.

ARMORED SYSTEMS MODERNIZATION
PROGRAM SCHEDULE



This chart reviews scheduling for the separate variants. All, with the exception of LOSAT are in the early stages of development. LOSAT, the most mature system, will not require procurement monies until fiscal year 1994.

The fiscal year 1992 request supports the effort required to develop, mature, and integrate the specific supporting technologies, such as survivability, propulsion, track/suspension, vehicle electronics, Advanced Tank Cannon System (ATACS), System Engineering Analysis (SEA), and the Component Advanced Technology Test Bed.

ARMORED SYSTEMS MODERNIZATION

PROGRAM FUNDING ($M ESC)

	91	92	93
ASM GENERAL	178.5	303.0	228.8
BLOCK III	30.6	66.8	44.9
AFAS	34.0	52.8	100.6
CMV DEVELOPMENT	12.5	9.5	5.5
FIFV DEVELOPMENT	0.0	0.0	2.3
FARV-A DEVELOPMENT	0.0	0.0	0.0
LOSAT	52.3	152.3	141.9
ASM TOTAL	307.9	584.4	523.9

The funding also supports system developments with Advanced Technology Transition Demonstrators (ATTD) for the ASM heavy protection level variant chassis, AFAS, and CMV; advanced development for Block III Tank, advanced development and full scale development for LOSAT, and full scale development for the Multi-Option Fuze Artillery (MOFA).

We have heard Congress' concern over the priority of fielding of AFAS. AFAS has been accelerated to meet the availability of the armament technology required to support it. AFAS armament will be available in mid fiscal year 1995 for integration into a prototype. We have accelerated AFAS to start its prototype development as soon as the armament is ready. In addition, to permit fielding of a fully capable AFAS system, we have also accelerated the development of the companion rearm vehicle, the FARV–A, and keyed its critical milestones to those of AFAS. The AFAS and FARV–A schedules now reflect the earliest possible fielding dates consistent with the availability of the required armament technology.

ASM is a critical component of our modernization strategy. Given that our dollars are so small, we've got to be careful that the programs in our budget are absolutely required and are affordable. Any proposed improvement or new program has to meet three criteria. First it must fulfill an operational need. It has to help the soldier. Secondly, it has to be executable. We have to support programs that we can get through the acquisition process without major problems. Third a program must be approvable by the Office of the Secretary of Defense (OSD) and the Congress, and we must be careful not to oversell it. We cannot go to OSD nor to Congress and promise things we cannot deliver. When we contemplate the few new programs we will have over the next few years, we should think more about program execution than we do about program marketing. It is one thing to sell a program on the basis of predicted capability, schedule, or cost, but we had better be able to meet our predictions. Those three factors—need, executability, and approvability—are the three criteria I think we ought to apply to any proposed weapon system or product improvement.

ASM fulfills these three criteria. We have established the operational need. The threat is there, and getting more widespread through international arms sales. We have established a realistic and executable schedule that includes prototyping. We have made it affordable through the use of commonality in development, production, and components. We believe that we have built a sound program based on promising technologies and an executable and affordable acquisition strategy that will meet the approval of both OSD and Congress.

SHORTFALL

Senator INOUYE. Thank you very much. The committee has been advised by OSD that, as a result of the anticipated budget environment between the years 1998 and 2008, and coupled together with your need to fund concurrently the LH and the ASM programs, you will very likely experience a shortfall of about $19 billion. Is that estimate correct?

Mr. CONVER. Sir, I cannot speak to the exact number in terms of shortfall. I am not sure precisely what the shortfall refers to. I am not familiar with the number $19 billion. I can tell you we certainly have a lot less procurement money than we would like to have and I am not sure what you are referring to with the $19 billion.

Senator INOUYE. The estimates show a $19 billion shortfall between fiscal year 1998 and 2008 based on an annual funding level equal to the Army's estimated requirements in fiscal year 1997.

Mr. CONVER. Sir, I am sorry; I am not familiar with the document to which you refer. We would be happy to provide an answer for the record if we can get some more specifics on that from the staff.

Senator INOUYE. We would appreciate that.

[The information follows:]

BUDGET ESTIMATE

The $19 billion shortfall is based on an unconstrained statement of requirements and a topline Research, Development and Acquisition funding level approximating the FY 1997 value in the FY 1992–1997 Program Objective Memorandum [POM]. This level does not include an allowance for inflation. At this time, the Army has received no fiscal guidance for the years beyond FY 1997.

The Army is initiating its long range planning for the FY 1994–2008 period. This planning will provide the basis for the FY 1994–1999 POM which will be submitted to OSD in the spring of 1992. This process will result in a prioritization of total Army requirements within specific fiscal guidance.

The LH and ASM remain the Army's top two RDA programs. As such, they will continue to be supported throughout the planning, programming and budgeting process.

ARMORED SYSTEMS MODERNIZATION PROGRAM AND BUDGET

Senator INOUYE. Because of the projected budget shortfalls, have you considered the option of terminating all of the heavy ASM vehicle except the Block III and the combat mobility vehicle? We have been so advised; is that correct?

Mr. CONVER. Sir, I think during any budget exercise—and we went through a very painful one about a year ago in putting together the 1992–93 budget, we looked at a lot of the options, and I would say everything was on the table, but I will tell you that the top two priority acquisition programs in the Army are the LH program, is No. 1, and the ASM programs is a close No. 2.

I can tell you from my personal observations of the process that I really do not think that anyone ever seriously considered terminating the heavy variants of ASM or any of the variants of ASM.

Senator INOUYE. Can you advise us of, by year, what the funding levels would be required to support the ASM Program through completion?

Mr. CONVER. Yes, sir; we have all of that information. And I would be happy to either read it to you here or to provide it in tabular form for the record, whichever you prefer.

Senator INOUYE. For the record.

Mr. CONVER. All right, sir.

[The information follows:]

ARMORED SYSTEMS MODERNIZATION COST

[In millions of dollars, escalated]

Fiscal year	RDT&E	Procurement	Total
1992	584.4		584.4
1993	523.9		523.9
1994	647.6	19.0	666.6
1995	509.1	277.1	786.2
1996	339.5	653.8	993.3
1997	622.6	724.5	1,347.1
1998–2013	5,175.6	48,454.6	53,630.2

An additional $53.8 million is required in fiscal year 1992 to accelerate fielding of the Advanced Field Artillery System and its companion system the Future Armored Resupply Vehicle—Ammunition as intended by Congress.

Senator INOUYE. In essence how much?

Mr. CONVER. The total cost of the ASM program, in then year dollars, is, as you mentioned in your statement, sir, about $55 billion. That sounds like a lot, but the committee should understand, that that is money that is starting to be spent now that will be spent over the next 20 years, and it is also in then-year dollars. If you put that in 1992 dollars, it will be a fraction of that.

LIGHT HELICOPTER COST

Senator INOUYE. Can you do the same for the LH?

Mr. CONVER. Yes, sir; we certainly can. I will check the numbers, but the LH is roughly $38 billion. Again, the spending on that program has already begun in the R&D, and that funding will be continued and spent through basically the first decade of the next century.

We will be procuring 1,292 minimum vehicles, air frames, and the last delivery will occur in about 2009 or 2010. We will be procuring at about 120 a year. We do have an option, if we can convince the Secretary, and this decision will probably be made well downstream, to increase the total buy from 1,292 to 1,681 based on future force structure decision, would be the next increment that we might be able to get. And that would imply a rate increase of 120 a year up to 144 per year, but it is basically a $38 billion program, then-year dollars, R&D, plus procurement.

Again, we would be pleased to provide the detailed year-by-year funding stream for you for the record.

Senator INOUYE. I would appreciate that very much.

[The information follows:]

LIGHT HELICOPTER

The light helicopter funding requirements in the fiscal year defense plan by year is shown below:

[In millions of dollars, escalated]

	Prior years	Fiscal year—					
		1992	1993	1994	1995	1996	1997
RDT&E	1,258	550	608	562	598	569	376
Procurement			9	48	154	503	1,646
Total	1,258	550	617	610	752	1,072	2,022

Note: Funding requirements shown here include funding for Longbow LH integration.

THREAT ASSESSMENT

Senator INOUYE. The ASM Program that we see before us, and the LH Program that you have described, result from a threat assessment that you have made of the Soviets and the Warsaw Pact, and this assessment was made, I am certain, over 2 years ago.

Have you made any current reassessment as a result of the current development?

Mr. CONVER. Yes, sir; I would say that the threat assessment that underlies the ASM Program, specifically the Block III tank portion of it, is a fairly fluid situation. I would say that it is not a matter of certainty.

We have got the intelligence community working on that very hard and I have spent a lot of time looking at that threat assessment because it literally is the underpinning of the Block III tank program.

That assessment is fraught with uncertainty and I will try to characterize it for you in several ways. One, I will tell you that the date at which we expect to see the new Soviet tank, which is, as we call it, the Future Soviet Tank III, or FST III, that the date at which we expect to see that [deleted].

We now expect to see it, and the precise number is classified, [deleted]. So that is the first thing.

The second point is the threat assessment is largely based on extrapolation of what the Soviets have done in the past. [Deleted.]

So basically what we try to do is extrapolate what the Soviets might do based on their past performance and how that past performance might be altered in view of the new situation in the Soviet Union.

In the past, the Soviets were putting out a new tank every 8 years. And they had, as I recall, about five tank plants doing that. We expect to see a contraction in the industrial base in the Soviet Union for tanks and, if memory serves, I believe we expect them to reduce from five to some lower number, and, again, I do not want to be terribly specific in an open hearing.

On the other hand, we do think that the 8-year cycle for the appearance of new tanks will probably be lengthened. And that is the basis, I believe, for the [deleted] that now stands, the new tank for the Soviets, [deleted].

General McVEY. Sir, I think a lot of people were very concerned about the T72M1's that were in the hands of the Iraqis in the KTO. That is a Soviet export model. It was produced in 1979. While it had a 125 mm gun on it, it did not have the best Soviet bullet, which was good for us because it meant that we could outrange them with our 829–A1's by a considerable margin, nor did it have reactive armor improvements that the Soviets have on existing tanks that they own.

For example, the T72M1 was built in 1979. In 1983 they came out with the T80. As Mr. Conver said, the Soviets have five tank plants. Two of them produce the T72 variants and two of them produce the T80 variants. They are very similar type tanks. In 1986, the Soviets fielded the T72B.

In every version of a Soviet improved tank there is an increase in their kinetic energy armament, [deleted] protection level, that is, and in chemical energy they improve it dramatically with the use of reactive armor.

In 1986, they fielded the T72B, and in 1988 they fielded the T72B1, and then again in 1989 they fielded the T80U.

What this says is the Soviets export a tank that is never as up to date in terms of protection level or lethality, bullets, as what they have. There was no thermal capability that we know of on the T72's sights in Saudi Arabia. They have it on their aircraft. They have it on other systems.

We believe that the Soviets' FST II and their FST III will be fielded [deleted] and will have to concentrate on thermal sights. They have to be able to see as well as we do.

They will continue to work on their bullets and they will continue to try and improve their vehicles. For that reason, we think we have to continue to push our technologies. The technologies that we had in the 1970's and we fielded and we trained with in the 1980's gave us the advantage in the 1990's, and that generally has to be the way that we have to continue with the ground forces. Thank you.

Senator INOUYE. I realize that it would be dangerous to get involved in this prediction game because even the KGB is reportedly advising all of its members that they should be prepared for a civil war of some sort, but in listening to your responses, Mr. Secretary, you have indicated that there will be a significant slowdown in the development of the FST III.

If that is the case, would it be prudent and cost effective to lose the M–1 family?

Mr. CONVER. We are on a little bit delicate ground here because we are serving two masters. On the one hand we are going to support the President's budget as it was submitted by the Secretary of Defense, and we feel obliged to do that.

On the other hand, it is no secret that, as I mentioned in my opening statement, we try to support an upgrade program in the Army's submission to OSD. We felt that an upgrade program was a prudent thing to do, not at the expense of ASM, but in addition to ASM, but because of affordability reasons I think there was general agreement in OSD that the M–1 upgrade program was a meritorious idea, but that it was determined to be simply unaffordable.

So it is clearly something that we, the Army, and OSD would all like to do, but at the current level of funding it was the Secretary's judgment that that was not an affordable thing to do, and we had to stand by that decision.6602

M–1A3 PROGRAM COST

Senator INOUYE. Did you reach any estimate as to the cost of this M–1A3 program?

Mr. CONVER. Sir, it was not an M–1A3. It was an upgrade program that would take basic M–1 vehicles from the basic configuration up to the M–1A2 configuration. The program that we submitted to OSD was a very modest program of about $600 million over the 6-year period. To do that program at a rate of about 240 per year, in very round numbers, the cost of that, once you get up to rate, and that takes about 3 or 4 years to do it, but once you get up to the 20-a-month rate upgrade it is about $1 billion a year program, to do 20 a month or 240 a year.

Obviously, what we have submitted in the Army budget was simply a very small downpayment on that cost, but it is about $1 billion a year once you get up to the full rate of 20 per month or 240 per year.

PROGRAM/SYSTEM PRIORITY

Senator INOUYE. Just to refresh my memory, your first priority is the Block III. The second is the artillery?

Mr. CONVER. I would say that is a fair characterization, sir, but I guess we do not look at it in terms of picking and choosing in the sense that, if we have one as the third priority, that means one that we would willingly discard, but clearly we have tried to accelerate as much as we possibly could the Block III tank and the artillery system, but I am sure the combat engineers will tell you the combat mobility vehicle is just as essential to their mission as the tankers would tell you the Block III is to their mission.

So I am not sure quite how to respond other than to say we have tried to do the tank and the artillery first. That does not necessarily imply that we would place any greater sense of importance on the combat mobility vehicle or the others in the family.

General MCVEY. Sir, if I may, what we are driven by in terms of priority are the things we have to do for artillery. We have to make a decision in September of this year on the gun propellant, whether we are going with liquid propellant or whether we are going with unicharge.

Once you make that decision, then we have to fabricate and build the cannon so we can get the extended range to meet our requirements. We then have to take those systems and put them on a demonstrator to make sure that we have it integrated before we spend a lot of money, and then go into full-scale engineering development.

At the same time, we are doing the common component chassis and the tank. The most difficult chassis problem to solve is the one for the tank because it is designed to close with the enemy. It has to go cross-country at rates of speed that are superior to that of an artillery piece.

What we are trying to do is close the mobility delta, so if you solve the engineering problem for the tank chassis, it is easier to build down than it is to start and build up, to add. If you solve the mobility problem for the tank, the tank and the future infantry vehicle have to have the same mobility because what we need to do is make the infantry fighting vehicle an assault vehicle, so it needs heavier protection levels to work with the tank.

Right now the tanks have to lead and infantry has to follow, which is entirely different than what we used to do years ago. The infantry went first, formed the battlefield, then the tanks came in a counterattack and tried to kill.

We have just the reverse now. Tanks go first with the infantry following.

So technically it makes it easier for us to develop the chassis for the most difficult system, but we are not making the artillery wait for that chassis because we want to get gun propellant decisions, then we have to fabricate the gun, we have to do the fire control, we have to integrate it into a system, put it on the chassis, and go through full-scale engineering development.

In short, and I realize I have been lengthy, we figure the tank will come into low-rate initial production in the first quarter of 2003 and that the artillery piece will enter low-rate initial production fourth quarter 2003. So they are essentially coming in at the same time.

ARMY INDUSTRIAL BASE

Senator INOUYE. Thank you very much. Before I call upon Senator Stevens, I would like to note that I asked the question on upgrading the M–1 because of the concern that not only I have, but the committee has, of what we are doing to our industrial base.

We may find ourselves with no plants.

Mr. CONVER. Mr. Chairman, we share your concern. I think industrial base considerations are a very legitimate factor to be taken into account when we do our budgeting. I am not sure that we have done all that well in the past.

We tried to remedy that in our initiatives this year. It did not work out. I will tell you that the industrial base for tanks is, as was mentioned earlier, in serious jeopardy. It used to be a very small gap of 3 or 4 years between the end of the M–1A2 production and the start of the Block III production. Events have transpired to lengthen that gap to as long as 10 or 11 years with no production.

Foreign military sales and the residual delivery of tanks that are already on order may carry us out to about the 1994–95 time period, but what has happened to us, for affordability and other reasons, is that the date at which the new tank, the Block III tank is supposed to enter service, has slipped.

In the last 18 calendar months we have seen that date for the Block III tank slip from basically fiscal year 1997 to fiscal year 2003, as General McVey mentioned. So by extending and slipping the time at which we want to bring the new tank on, we widen the gap during which there will essentially be no tank production.

And that, in part, was one of the reasons that we felt that it was important that we in the Army support a tank upgrade program. Unfortunately, our proposal was just determined to be unaffordable. So now we are looking at the prospect of maybe having a 10-year period between the cessation of M–1 activity and the onset of Block III activity.

As I mentioned earlier, that is going to be a devastating thing for the tank industrial base and something that concerns us very greatly, because when we go to build our Block III tank we certainly would like to have some companies there that are capable of doing that work for us and skilled workers and so on and so forth.

General MCVEY. Sir, I would like to comment. I feel responsible partially for not being able to provide the data to Defense to actually capture the criticality of a declining tank and medium-chassis Bradley base. We forecasted that as we go down in size it will be very difficult to maintain that because there is no civilian application for 120mm guns, even automotively for a 1,500-horsepower power package, to do what we want to do.

There is one engine maker that can meet that at this point, there are a couple out in the future, but there is no commercial base that we can fall back on. So the overhead and the technologies that we have and the people that work those problems are very talented, and they are going to go away.

We are experiencing a decline and an erosion in the tank base as we speak. We are going to one plant. That impacts both the current plant in Lima that will stay open and the plant in Detroit. We have closed assembly, or we will close it this year, assembly of tanks in Detroit. We will maintain the machining operations at Detroit because it is just too expensive to move it to one facility, but that also means that we have to cut down the number of skilled welders in Lima because of the declining assembly rate. But the real impact is being felt in the vendor base and the supplier base throughout the country that supports the prime contractor.

And they are beginning, particularly the smaller, dedicated contractors that do little bits, they size their operation to support that program, and as it goes down their decision is they cannot afford to do it any more. And we are losing them.

I am keeping a record of those people and intend to bring it forward to show that this is what is happening. For that reason, I am very concerned about the industrial base and share your concern.

Senator INOUYE. I would like to point out that this subcommittee intends to have intensive studies made on the industrial base problem. We already see that happening in submarines, in airframe manufacturers, tanks, and many, many others, and so if we do not watch ourselves we may not be ready for the next big one.

Senator Stevens.

Senator STEVENS. Thank you, Mr. Chairman. You said that 60 percent of the parts for the six systems in the ASM package would have a common base; is that right?

General MCVEY. Yes, sir; there is a chart, if I can get to it, sir.

Senator STEVENS. I looked at it. I am trying to get somewhere else, though.

BLOCK III AND M–1A2 COMMONALITY

How much commonality is there between the Block III and the M–1A2?

General McVEY. Sir, the M–1A2 is the foundation for the ASM systems in terms of databusses and powerbusses, in terms of dual-access head mirror, the fire control. What we get is the foundation. We will have a second generation FLIR night sight on the Block III.

Senator STEVENS. I am talking about the basic package now—propulsion, protection, structures, and frame. How much commonality is there between that Block III and the M–1A2?

General McVEY. Virtually none, sir.

Senator STEVENS. Why?

General McVEY. Because we want to improve the track. Currently we have a 2,000-mile or 3,000-mile track on the Abrams. The requirement for the heavy variants in the future is a 6,000-mile track. Currently we have torsion bar suspension on our vehicles. What we want to do is go to hydrothermatics because it makes you lower. So that is different.

The propulsion system that we propose, vehicle propulsion system for the future systems are to get the same horsepower at 50 percent more fuel efficiency, and that is a new engine and new transmission. Fire control is pushing the state of the art because we want to be more lethal. We want to be able to see better.

Although we have a very good kinetic energy package on our current M–1A1, we want to be able to get smaller and we want to have modular armor. Some of the technologies will be the same, but the parts will be different.

Mr. CONVER. Let me——

Senator STEVENS. I am going somewhere, if you do not mind, Mr. Secretary. We ended up this time with some older tanks in the field.

General McVEY. Yes, sir.

Senator STEVENS. How many 60's did we have out there?

General McVEY. The U.S. Army had no 60's. There were M–60's in the Marine Corps. We fielded a batallion of M–1A1's to the Marine Corps, plus an additional company of M–1A1 common tanks to the Marine Corps.

Senator STEVENS. What is the life span of the M–1A2?

General McVEY. We calculate 20 years, sir, but you could extend that.

Senator STEVENS. No matter what we do there is going to be M–1A2's and Block III's running on the same battlefield, right?

General McVEY. Yes, sir.

Senator STEVENS. Why is not there more commonality?

Mr. CONVER. Let me take a stab at it. I guess I think from a prudent acquisition point of view, if it were possible to have a lot of commonality between the Block III tank and the M–1A2 tank, I do not think there would be much need for a brand new Block III tank.

If we could look at what we have and say these are the same components in the M–1A2 tank, and we can just lift intact and put them into a new tank, then I guess, as the manager of the acquisition activities in the Army, I would take the view that there is no need to go to a new tank. What we ought to do is upgrade and not build a new tank at all.

Senator STEVENS. The idea, and I appreciate what the General says, we are going to reduce the amount of support. We are going to reduce the necessity for inventory control, for maintaining all of the spare parts in a Hail Mary offense that you would have to have, but it sounds to me like you are going to have two, maybe three generations of tanks out there, so you are going to still have three support groups, still going to have three inventories.

It seems the real problem about this whole ASM package to me is it does not build on what we have got that has just proven itself. I will tell you, you are damn lucky I am not Secretary of Defense because I would send you back to the drawing board. I just do not understand that.

It is going to increase the number of people generally in the field, if we have one at the turn of the century, rather than decrease it, because you are going to have three tanks there, you will have three sets of—you will not be able to have the ASM in quantity by then either.

I just do not see that it builds on what we have got. And I want to explore—let me ask you, What does it do for the light divisions? What does the ASM do for the light divisions?

General McVEY. The ASM by its definition is for the heavier systems, the armored mechanized divisions.

Senator STEVENS. So the whole Vessey initiative is out the door if we go ASM?

Mr. CONVER. No, sir; I do not think that is an accurate statement.

LIGHT FORCES VARIANTS

Senator STEVENS. Where are the comparables for the light divisions?

Mr. CONVER. Sir, the armored gun system, which I mentioned, not shown on the chart, is our light variant that will be used by the light forces. We lump that in as part of the ASM Program and the armored gun system is going to provide a very needed capability to replace the Sheridan vehicles that are currently in the light forces, but ASM, as the General suggested, is primarily oriented toward the heavy side of the force.

I do not think we are taking the view that we are favoring the heavy side over the light side. I think we are taking the view that we need to have a balance between the two.

And with respect to the point about building on what we have, Senator Stevens, I guess we look at these decisions on a case-by-case basis, but eventually you get to the point where it makes sense to go to a totally new platform.

We recognize that it is going to be very difficult in the current budget environment to move to new platforms across the board and, in general, we are trying to avoid that, but we are talking about a system that is going to come into the force in 12 or 13 years, and we are trying to plan prudently for that system.

As General McVey said, the reason we feel we need a new platform is that we need a new engine, we need a new suspension, we need new armor, we need a new gun system, and eventually, not now, but downstream we need to have a system that is not evolutionary but which is more revolutionary.

Ideally what we would like to do, given enough money, is we would like to do M–1 upgrades and evolve the M–1 tank and upgrade the very basic M–1 tanks that have 105 mm guns, up-gun those to the 120 and put them in the M–1A2 configuration.

When that program terminated, then we could have an orderly transition to the new vehicle. Unfortunately, the affordability just does not allow us to do that.

Senator STEVENS. You are also making decisions for four Commanders in Chief from now?

Mr. CONVER. Yes, sir.

Senator STEVENS. As to what that Commander in Chief will need for any contingency in the world. What I hear is you are going to probably 12, 10 to 12 heavy divisions. It does not seem to me to be the kind of decision, you want us to be revolutionary, not evolutionary, and I do not think we have that right after this last engagement.

PACIFIC ISSUES

Let me ask you some questions about what is going on up our way in the Pacific. We understand the Soviets are, in fact, moving some of the armor that they would have to destroy if it stayed in the European theater across to Europe. You are aware of that, are you not?

Mr. CONVER. Yes, sir.

Senator STEVENS. You are aware that 8 out of 10 of their new naval vessels are going into the Pacific. The Soviet Far East and Siberia is becoming the armed camp of the Soviet Union.

What can these things expect to do on the tundra? Are they ice-capable? Are they going to survive in the deep winter? That is what they are building. This looks to me like a desert force, General.

General MCVEY. Yes, sir; it does, but it is also a cold weather force. When we test them, we have to test them for the cold weather environment.

Senator STEVENS. If they are lower, they are not going to run across tundra, and they certainly will not get across the kind of natural conditions that exist in the Soviet Far East and Siberia, nor would they get through jungles.

I am not, and I do not think there is a greater hawk in the Congress today than me, and I do not like what I am hearing. I hope that we can get around to looking at some of the concepts of building on what we have. That is the problem with the industrial base. We are projecting stopping one line and starting another one 10 years from now.

TANKS FIELDING DATES

Senator INOUYE. Just for the record, if my recollection is correct, the Abrams was fielded in 1982 or 1983?

General MCVEY. Sir, we fielded the first one in September 1980. We fielded in Germany in 1981, March.

Senator INOUYE. The Bradley about?

General McVEY. The Bradley about 2 years behind, sir.

Senator INOUYE. What is the projected life of these two vehicles?

General McVEY. Sir, for the tank, if you put it through rebuild, it can go for 20 to 30 years. We cost procurement at 20 years. You can upgrade the system by putting it through depot overhaul, changing components, changing out the armored package. They can last indefinitely if you want to invest upgrades that way.

The Bradley is an aluminum-based vehicle. We figure it for 30 years, or 20 years I think it is for procurement. Can we make improvements to them? Yes; I think you could by running it through a depot system.

Senator INOUYE. Thank you.

Senator STEVENS. How many of these are air mobile?

General McVEY. Sir, you can put—are we talking ASM, sir?

Senator STEVENS. Yes, sir.

General McVEY. All of them, sir, will be capable by C–17, but you are talking two, three tanks on one lift, two AFAS, two CMV's, so it is really not the way that you would deploy that force unless you are in extreme emergencies.

Senator STEVENS. It would seem that the LOSAT would have one of the highest priorities. If I understand the new systems right, that is a command upgrade system, right? That was the one defect we had in the last operation, was the ability to have rapid mobility, real mobility for our command vehicles, right?

LINE-OF-SIGHT ANTITANK [LOSAT] SYSTEM

General McVEY. The LOSAT system is the system that replaces the interim TOW vehicle or improved TOW vehicle. This is the one with the kinetic energy missile.

Senator STEVENS. I understand, but isn't it also for command and control?

General McVEY. No, sir.

Senator STEVENS. Where is the new system for command and control then in ASM?

General McVEY. It is not in the first six systems, sir.

Senator STEVENS. Maybe I should not have gotten up this morning. That is the defect. Everyone I talk to says that is the problem that came out of the Persian Gulf.

General McVEY. I do not disagree with you, sir.

Senator STEVENS. And we are supposed to make decisions now for production to start in 2002 or 2003, Mr. Secretary, is that right?

Mr. CONVER. Sir, what we are asking you to do is to make a decision today that preserves the option of making that decision around the turn of the century. We are not making an irrevocable commitment to production in 2003, but if you should decide not to support this program, we foreclose the option of building these systems around the turn of the century.

General McVEY. Sir, if I could address the second package, you have a command and control vehicle. Granted, that is a very serious deficiency that we have. I mentioned it when I talked about the KTO, and you have data from people you have talked to.

If we have the mobility platform, the Bradley platform, if we have the LOSAT platform upgraded, it is much easier to do a module so we can have the command and control elements in it. You would take the command and control elements from the heavy chassis, the positive navigation, the digital controls, first transmission, and configure it in that vehicle.

If we do not do the R&D work, it will be more expensive on an each-by-each basis and it will take us a lot more time. So if we do the R&D effort, we can modify the program once we have the technologies in hand.

LIGHT DIVISIONS

Senator STEVENS. Well, I remember listening to General Vessey about the necessity for light divisions, and I think I am seeing a blueprint for eliminating the concept of peacekeeping and, instead, getting ready for heavier war.

We have just had a war against the fourth largest army in the world and we were extremely successful. We contemplate the possibility with the second largest one, and I think that is still the case. The third one I do not contemplate ever being involved with them in warfare, so that what we are looking at is a lesser stature of armies that might cause us trouble all over the world.

Why build a heavy force to deal with contingencies like Vessey when it is really a light force that we need?

General MCVEY. Sir, I believe what the Army really needs is the balanced force. We need the light, we need the heavy, because if you find yourself in a situation where you do need a heavy force you cannot get it quickly.

The same with the light. If you do not have the balanced force and somebody calls you to task to go, you have to be ready.

What we are trying to do is have the technology so we would have a contingency core with these highly mobile, more deployable systems ready to go should they be needed.

We also need the light forces and the 82d Airborne for those missions. I, unfortunately, only deal with ASM, sir.

Senator STEVENS. We have MLRS, ATACMS, SADARM. If we have got those advanced submunitions for engagements with heavy divisions of an enemy, why do we need more heavy armor at the same time?

Mr. CONVER. Sir, this is predominantly a military issue, but I would emphasize what General McVey said. I do not think anyone would have been comfortable trying to fight Iraq without heavy armor.

Senator STEVENS. That is true, but we have just reduced down the size of the fourth largest army of the world.

Mr. CONVER. If someone were prepared to say that we would never again have to fight a battle like that, then I guess we would be inclined to agree with your assertion, but I do not think we feel the same comfort, perhaps, that you do in that we will never again have to fight a battle with heavy forces.

We listened to the same arguments last year with respect to the heavy forces, and people were saying we were not going to need them because the European, Central European threat was going away, and people were saying we probably did not need the deep fire systems like JSTARS and ATACMS and things like this, because the European theater was going away, and less than 1 year later we had to bring all of those forces to bear in Iraq.

So I guess we are not as sanguine, perhaps, as you might be with respect to the need for heavy forces in the future.

On the other hand, we do not believe that we should neglect the light forces. We think we should have a balance between the two. What we are talking about here today is predominantly the heavy side of that, although there is one vehicle, the armored gun system, which is a lighter vehicle.

Senator STEVENS. I asked you where the light side is. Where is it? Where is the similar support for the light division?

Mr. CONVER. Sir, I think the support for that resides in the systems that you have alluded to, the submunitions.

LIGHT DIVISIONS' ARMOR

Senator STEVENS. Where is the armored, the AFAS for the light divisions? The light division does not have artillery, Mr. Secretary.

Mr. CONVER. Yes, sir.

Senator STEVENS. It would seem to me if there is a defect in the system right now it is artillery for the light divisions. You are coming in with artillery for the heavy divisions. You are looking at two people that made the decisions while you were still in high school that gave us the material that we have just used in this gulf war.

Now, we have made tough decisions for heavy divisions in the past, but we also thought we started an initiative for light divisions to deal with contingencies that we envisioned for the future. This envisions only heavy division capability for the future in my opinion.

COMMAND AND CONTROLS FOR LIGHT DIVISIONS

How about command and controls for the light divisions?

Mr. CONVER. We have a whole series of command and control initiatives underway that deal with what we call the SIGMASTAR, the air defense portion, the artillery portion, the armored portion, and so on and so forth.

Senator STEVENS. I am talking about ground, for the light divisions on the ground, where is their command and control vehicle?

Mr. CONVER. We do not have a separate dedicated vehicle for light division command and control as part of ASM, if that is your question.

Senator STEVENS. That is my question.

Mr. CONVER. We do not have a dedicated command and control vehicle for light divisions as part of this.

Senator STEVENS. Mr. Chairman, I think we should have a classified session on this. I think we should get into the whole question of the threat. I am not satisfied that we have defined the threat that is out there sufficiently to make this kind of judgment at this time.

Thank you very much.

BALANCING THE FORCE

Senator INOUYE. Thank you. Secretary, General, what Senator Stevens has been bringing up is very important to this committee. Your presentation this morning, the chart here and your focus on ASM, your light vehicle does not even appear on this chart, would give us the impression that what you are proposing to us is not a balanced force. It is just going to be heavy.

M–60's are going out of business. All of the other tanks are going to be out of business in 20 years or 30 years. This is the new generation and our concern is where does the light come into the picture?

Mr. CONVER. Let me try to address that. The subject of today's hearing is ASM, which is, by its very nature, oriented toward the heavy side. I guess I hate to leave the subcommittee with the notion that we are neglecting the light side.

Let me try to address just a few of the programs that we have that address the light. First of all, we have the light helicopter, that we have not talked about, it is not the subject of today's hearing, but the light division, the LH helicopter will be something that would be very useful in the support of light divisions.

We have a whole series of munitions, some of which Senator Stevens addressed, but one in particular that we have not talked about is the AAWS–M, which is the replacement for the Dragon, the single-man, portable, antiarmor munition.

We would have felt much more comfortable if the initial light forces deployed to the gulf would have had that kind of capability as opposed to the aging 30-year-old Dragon system.

We have a whole series of submunitions. We do have the armored gun system that we are working very hard on. I think there are a whole series of things that are being addressed for improving the light forces down to the initiatives that we have to improve the lethality and survivability of the individual soldier on the battlefield, our soldier enhancement program, the squad automatic weapon, the personal arms handguns, the soldier's protective equipment, chemical gear, everything.

All of these things are designed to enhance the lethality of the light divisions, the individual soldier, small-company-type units. I think we have a very balanced program limited only by affordability and our ability to do a lot of things simultaneously.

I do not think we are standing in any way, shape, or form toward the heavy. Although if we focus simply on the subject of today's hearing, which is ASM, one could wrongly get the impression that we are doing that at the detriment of these other things. I do not think we are doing it at the detriment of those things at all.

I understand Senator Stevens' interest in the light divisions and we share that interest, but the subject of today's hearing is ASM and that is what we were primarily oriented to talking about. That should not infer that we are not attendant to the needs of the light divisions or the individual soldier because I think we have a lot of things that are oriented precisely in that direction.

ASM WEIGHT REQUIREMENT

Senator INOUYE. I would like to now get to the weights picture. When the proposal for ASM was made I believe you had a minimum of 55 tons and a maximum of 62?

General MCVEY. Sir, the goal was to try and develop a tank in the 55-ton arena with certain protection level requirements. When the RFP went out, looking at all of the responses and talking to industry and the Government's analysis, to achieve the protection levels that we needed, it was determined that about 62 tons should be achievable.

Senator INOUYE. I am sure you are working very closely with the other components, such as the Military Traffic Management Command, and I believe they have indicated that they would prefer something at the 55 level?

General MCVEY. Mr. Chairman, the current constraining factor for sealift is about 65.5 tons, and that is decking. The requirement for airlift on a C–17 or C–5A is ramp weight, and that is about the 65 tons. We have done exhaustive studies on transportability as a function of weight, and the break point seems to be at 39,000 pounds.

If it is below that, you can get them on C–141's and C–5A's rather easily. Once you get above that rate, the next break point where you start to have trouble is about the 64-ton capability.

What we are trying to do is develop the systems that have the protection levels that are required and make them smaller and more deployable. What we cannot do is get above 65 tons because then your existing bridging gives you a significant problem, your support vehicles, and they are much more expensive to run and operate.

Senator INOUYE. I asked that because I believe experience has shown us that whenever we develop a tank, we always add weight. On the M–1 I believe we went up about 20 percent in weight.

General MCVEY. Sir, we fielded the Abrams tank at 61 tons. The current one in production now weighs 67 tons.

Senator INOUYE. Was not the first one less than 61?

General MCVEY. When we produced it, it weighed out at 61.

Senator INOUYE. What about this tank, do you not think you will add a few more pounds?

General MCVEY. Sir, one of the tenants of ASM is to try and get modular armor to push the state of technology, to put in composites, to trade off armor protection with technical measures.

We are exploring all of those technologies. We are going to try to keep it at the 60-ton range, but even if we do grow, as long as we stay below the 65- to 70-ton range we think we will have it under control.

Senator INOUYE. When will your decision be made, just refresh my memory, on liquid or unicharge?

General MCVEY. September of this year.

TANK THREAT ASSESSMENT STUDY

Senator INOUYE. When will your threat assessment study be completed?

General MCVEY. Sir, we update the STAR, I believe it is annually.

Senator INOUYE. When can we get something definitive, because this, the threat assessment, is the foundation of the ASM Program?

General MCVEY. Sir, I will have to provide it for the record, the last STAR update, and then see when one is scheduled, sir.

[The information follows:]

THREAT DOCUMENTATION

The Armored Systems Modernization program has a baseline System Threat Assessment Report [STAR] which covers in broad terms the threat to the program. A system specific annex for the Block III tank has also been prepared to detail the specific threat to the Block III tank. The baseline STAR was validated by the Defense Intelligence Agency [DIA] in February 1990 and is currently being updated for revalidation in the next 90 days. The Block III annex was validated by DIA in June 1990 and will undergo annual review by DIA in June 1991. Threats to ASM are also covered in the Department of Defense 1990 Armor Anti-armor Net Assessment, provided to the Senate Armed Services Committee in February 1991.

140 MM GUN

Senator INOUYE. We have also been hearing about the 140 mm?

General MCVEY. Yes, sir; ATACS, advanced tank cannon system.

Senator INOUYE. Are the Europeans also doing this?

General MCVEY. Sir, we have a four-power agreement with France, Germany, United Kingdom, and the United States. We have a memorandum of understanding on the 140 mm gun. The significance of the gun really is in the breach. It is a much larger breach, 20 liters plus, and the gun mount.

We can either fire 120 mm rounds from that system or 140 mm from that system. We will also explore electrothermal/electromagnetic. What we really need to do with the 140 mm gun is work the breach, work the gun mount, do the developmental work. We can put the 120 mm gun in and capitalize on the work we have done on the improved armaments initiative. We can work the developments for the 140 mm munitions because that will give us more energy, a larger projectile at a faster rate or greater muzzle velocity, but we do not need to do that right now.

What we do have to work on is the breach issue so we have flexibility to go with whatever technology looks most promising.

Senator INOUYE. We are aware of the agreement that was reached between the United States and other European countries, but are they investing anything in it?

General MCVEY. Sir, in phase I of this program, each country was working with their own technologies. Next June, I believe, we enter into a phase II where we look at the promising technologies—the gun, the breach, the ammunition.

Senator INOUYE. They have involved themselves faithfully in phase I?

General MCVEY. I would say the French have made more progress than the British or the Germans at this point. And we will have to work that issue when we get into phase II.

Senator INOUYE. So you do not think that in the end we will be stuck by ourselves with 140's?

General MCVEY. I do not think so, sir. It is hard to predict. Everybody is working the same equation in terms of do we need to go to 140? Can we stay with a 120, or is this electrothermal technology going to be available in time, but by doing the gun breach and the gun mount and the autoloader work, they preserve their options.

Senator INOUYE. The Soviets have the 125 mount?

General MCVEY. They have the 125, sir, and the threat says they will go to a 135 mm gun.

Senator INOUYE. I have many other technical questions I would like to submit. I had hoped to have this hearing go on a bit longer, but, as you may know, we have a joint session scheduled in half an hour to receive a message from the President of Nicaragua, so I will have to submit these questions.

Do you have any?

Senator STEVENS. I have some to submit, too.

Gentlemen, I do not mean to be offensive. I just sometimes have a problem of time zone change too much. I just returned from the West.

I really have got to tell you, I do not like what I heard this morning. I hope we can have a further hearing.

Senator INOUYE. You will learn that Tuesdays are bad days for hearings here.

Mr. Secretary, General McVey, on behalf of the committee, I thank you very much. You have been very helpful, and, as Senator Stevens suggested, we may have to have a short classified hearing on this. There are other matters that I would like to touch upon in the classified hearing.

ADDITIONAL COMMITTEE QUESTIONS

[CLERK'S NOTE.—Additional questions submitted by subcommittee members, together with the Department's responses, will appear in the appendix potion of the hearings.]

SUBCOMMITTEE RECESS

Senator INOUYE. The subcommittee will now stand in recess until Tuesday, April 23. At that time we will receive testimony from the Department of the Navy on the A–12 aircraft program.

[Whereupon, at 10:31 a.m., Tuesday, April 16, the subcommittee was recessed, to reconvene at 9 a.m., Tuesday, April 23.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1992

TUESDAY, MAY 7, 1991

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9:04 a.m., in room SD–192, Dirksen Senate Office Building, Hon. Daniel K. Inouye (chairman) presiding.

Present: Senators Inouye, Johnston, Bumpers, Stevens, D'Amato, Cochran, Specter, and Domenici.

DEPARTMENT OF DEFENSE

U.S. AIR FORCE

STRATEGIC AIR COMMAND

STATEMENT OF GEN. GEORGE L. BUTLER, USAF, COMMANDER IN CHIEF, STRATEGIC AIR COMMAND

OPENING STATEMENT OF SENATOR INOUYE

Senator INOUYE. The Defense Subcommittee this morning examines two of the most controversial areas of the budget—strategic forces and the strategic defense initiative [SDI].

Our witnesses are Air Force Gen. George Lee Butler, Commander in Chief of the Strategic Air Command, and Ambassador Henry F. Cooper, Director of the SDI Organization.

We will divide the hearing into two segments. We will first address the strategic programs and issues and the SDI will follow. This will be our first opportunity to hear from each witness. General Butler assumed command of SAC just 13 weeks ago and Ambassador Cooper became SDI Director last July.

Both General Butler and Ambassador Cooper assumed leadership during the so-called watershed periods for charting the future directions, missions, and composition of the U.S. strategic forces and of SDI. Few issues of today's brave new world pose such daunting and important challenges for our Nation. General Butler and Ambassador Cooper must rethink and redefine their programs in a world of continuing, albeit reduced, Soviet strategic nuclear threats and of increased conventional threats.

Both United States and Soviet strategic forces are expected to be reconfigured and reduced under the limits of a Strategic Arms Reduction Treaty or START I. Budget constraints also will influence heavily strategic modernization efforts. U.S. strategic nuclear targeting policy is also under review and the Pentagon says significant changes to U.S. nuclear deployment planning already have occurred, and apparently more changes are in the offing.

For SDI, there has been a major shift in focus. Defending against a massive Soviet attack has given way to mounting global protection against limited strikes, or GPALS. SDI's charter has been expanded to develop theater and tactical ballistic missile defenses.

SDI remains the Pentagon's costliest research and development program, with almost $38 billion projected between fiscal years 1992 and 1997, yet as we reevaluate how much is enough for nuclear deterrence and strategic defenses, we should remember certain defense realities. The Persian Gulf reminds us that world affairs still can create an environment unfriendly to U.S. interests, and I think it would be well to note at this point that a few months before this none of us expected this war to happen. In fact, we were considering doing away with CENTCOM.

The war demonstrated the utility of strategic bombers and missile defenses in conventional missions. It also reminded us of the potential need to deter and defend against regional nuclear and ballistic missile threats in the future, and Soviet strategic nuclear modernization programs continue at a steady pace. So there is much to discuss about our strategic offensive and defensive programs and we obviously look forward with great interest to hearing from our witnesses.

First, before proceeding, welcome, sir. It is good to have you with us. You may proceed with any opening remarks that you may wish to have. Your full statement has been made part of the record. Please proceed, sir.

General BUTLER. Thank you. I will make brief opening remarks, Mr. Chairman. This is, indeed, my first opportunity to appear before this subcommittee. I appreciate the invitation and it is a privilege to be here this morning.

SUMMARY STATEMENT OF GENERAL BUTLER

I might begin by registering the comment that as the Commander in Chief of Strategic Air Command, I do, indeed, face a rather unique and compelling set of circumstances as I sit back and survey this new strategic landscape which you have mentioned in your own opening remarks.

Three or four points from that I would underscore. I could be characterized as the first CINCSAC of what has been described as the post-cold war era. That reality alone raises rather urgent questions about the nature or, in the minds of some, even the need for nuclear offensive systems that I command and target.

Second, as you noted I took charge of SAC one weekend into the Desert Storm air campaign, so that was a galvanizing moment for me as I was witness to, and long-range manager of, some 16,000 people, over 70 aircraft, over 300 tankers, and more than one-half of my strategic reconnaissance assets which were involved in that extraordinary campaign.

I have spent a considerable amount of time, Mr. Chairman, thinking through that participation and drawing conclusions from it. To date, I have two. First, I am extremely proud and gratified by the performance of our people. Second, I am concerned about the fact that although our bombers did a magnificent job, the fact that they were exposed to a very high-risk environment for these old B-52's had a great impact on the nature of our tactics. It drove us to high altitude and essentially took away our preferred operating envelope.

FUTURE ROLE OF MANNED BOMBER

Consequently, as I reflect on the future role of the bomber in an environment like that, it is clear to me that modernization is the key to SAC's ability to bring the invaluable, I think irreplaceable, assets of the manned bomber to the future conventional battlefield.

Third, notwithstanding this hopeful new United States and Soviet relationship and prospects for a significant arms control agreement in the form of the START accords, I still, as CINCSAC, confront the dawning reality of a rather extraordinary Soviet nuclear offensive arsenal and the fact that they proceed, for whatever reason—and I find this almost unfathomable—with a strategic nuclear modernization program that far exceeds the pace and scope of our own.

Finally, and self-evidently, like every other major U.S. military organization, SAC is coping with rather sharp reductions prompted by shrinking resources, and those reductions impact people, weapons systems—that is, our force structure, our installations—and they have constrained the modernization programs that were put on the books many years ago.

The upshot of all that, Mr. Chairman, is that I see it as my challenge to posture Strategic Air Command to play a leading role in both the familiar, but perhaps less urgent, less galvanizing realm of nuclear deterrence, while at the same time to participate in this unsettling new era of perhaps intensified regional conflicts which engage the vital interests of the United States.

TWIN TRIAD

I view it as my task, then, to meet this twin responsibility with reduced numbers of weapons, platforms, combat crews, support personnel, and installations. I have a vision for meeting this challenge, Mr. Chairman, and I call it the twin triad.

The thrust of the twin triad concept is to refocus the unique capabilities of SAC weapons systems into not one, but two tasks: the longstanding and enduring role of nuclear deterrence, which has been SAC's from the earliest days of our birth, a task which we have traditionally pursued with what we call the nuclear deterrent triad of ICBM's, SLBM's, and bombers; the SLBM's, of course, being the Navy's, but targeted by me.

But witness SAC's participation in Desert Storm, I envision what I would call a conventional warfighting triad made up of the systems that we employed in the gulf: reconnaissance assets, tankers, and the same bombers which have played such an important role in nuclear deterrence.

The linchpin of this twin triad posture, of course, then, is the multirole bomber, able to swing between a nuclear deterrent role and a conventional warfighting role according to the dictates of the unfolding national security environment.

For example, should there be, for whatever reason, a sharp United States-Soviet crisis, some or all of our bomber forces can be postured on nuclear deterrent alert if circumstances so demand, and that is something that we have done for decades.

Conversely, as we saw in the Persian Gulf, large numbers of bombers can be committed to conventional warfighting, operating, if necessary, from great distances, even from the United States if bases in the local area should not be available either to bombers or any other U.S. asset.

NATIONAL MILITARY STRATEGY

This latter point is particularly cogent to the new national military strategy, Mr. Chairman, which I know you have heard much of in previous hearings. This strategy places a premium on capabilities relating to range, mobility, and flexibility as the size of U.S. forces shrink, and as those forces are returned in increasing numbers from overseas to be based in the continental United States.

I can envision that in some future crisis, one which descends with little warning at a distant corner of the globe and quickly engaging our vital national interest, that the bomber may be the only available platform to the President with which to make a critical early reply to either discourage or slow an aggressor.

To do so, obviously a bomber platform in that circumstance would have to operate with great autonomy and with virtual impunity which brings me to my closing observation, and that is the key to the credibility of this twin triad concept, wherein the bomber plays a vital and irreplaceable role both in nuclear deterrence, as it has for years, and in conventional warfighting, as we saw in this war, the key to the credibility of that concept is modernization, and especially of the bomber force, on the one hand to meet the enduring demands of a strategy of nuclear deterrence as is still embodied in U.S. strategy and in the SIOP, and on the other hand, field a bomber force which can swing credibly between the demanding roles of nuclear deterrence and conventional warfighting.

B–2 NO. 1 PRIORITY

That is why, Mr. Chairman, I have underscored in my written statement the importance of the B–2 and listed it as my No. 1 modernization priority. Its revolutionary capabilities ensure the contribution of the bomber to nuclear deterrence well into the next century, and on the other hand, like the F–117, it has the potential to revolutionize the contribution of air power, and especially the bomber, to conventional warfighting.

I think I will conclude my opening remarks here, Mr. Chairman, on that fundamental point in order to entertain your questions. In closing, I would just once again reassert that my overall priorities are first and foremost the health and welfare of my people, some 130,000 strong, who have done such an extraordinary job not only in the gulf, but for four decades in ensuring nuclear deterrence.

Second, its readiness, because nuclear deterrence is a mission that never stops, and conventional warfighting, as we saw in the gulf, is a requirement which can be upon us instantaneously.

Third, of course, it is modernization, and my No. 1 priority is the bomber force, and finally, in my responsibilities as Director of Strategic Target Planning, I feel very deeply my obligations to ensure the production of an intelligent, integrated, coherent operational plan for nuclear deterrence.

That concludes my remarks, Mr. Chairman. I would be happy to answer your questions.

[The statement follows:]

STATEMENT OF GEN. GEORGE L. BUTLER

Mr. Chairman and distinguished Senators. I am pleased to provide for the record this report and my observations on the rationale underlying the forces assigned to, and the programs requested for, the Strategic Air Command.

GUIDING PERSPECTIVES

Three perspectives guided preparation of this statement: First, I have the distinction and the challenge of being the first post-cold war CINCSAC and Director, Joint Strategic Target Planning Staff. Second, my presence today puts me in a unique position vis-a-vis my previous appointment as the Director, Strategic Plans and Policy, Joint Staff, with responsibility for drafting the new national military strategy. Now, I find myself called upon to describe how that strategy affects the, Strategic Air Command with respect to arms control, the Single Integrated Operational Plan for nuclear weapons employment, and events within the Soviet Union. Third, the statutory responsibilities of CINCSAC and Director, JSTPS are compelling—they occupy the center of my attention. I feel very keenly the obligation to ensure deterrence by direct management of two legs of the strategic nuclear TRIAD and direction of target base planning and development for all three legs. Moreover, the inherent flexibility and consequent conventional tasks of SAC forces require that I also give strong emphasis to those aspects of the new military strategy that deal with the projection of conventional power to secure US interests around the globe.

Before discussing my vision of Strategic Air Command's role and posture in the years ahead, I want to offer a commander's perspective of the overarching strategic issues which guide my views. By now, you have heard from the Secretary of Defense and the Chairman, Joint Chiefs of Staff on the new directions in our national military strategy. Let me briefly sketch my own appreciation of the new guidance—not to repeat what you have heard, but to assure you that SAC is very much in step with its central precepts.

In my view, the emerging post-cold war environment is dominated by six new and historic forces that are largely reshaping the global strategic environment: (1) Soviet retrenchment and the end of the Cold War, events so consequential they are akin to a virtual second Russian Revolution; (2) German reunification and its impact on the European security agenda; (3) the emerging prospects for a 21st century Concert of Europe; (4) the intensification of intractable, regional strife and conflict, exacerbated by impatient populations and the proliferation of high technology weapons; (5) catastrophic failures in the human condition due to economic and political disintegration in areas of the Third World; and (6) the rise of new centers of power with either hegemonic or strongly competitive goals. Taken together, these forces represent a volcanic upset of longstanding strategic calculations and call for a sweeping reassessment of traditional views and approaches.

Simultaneously, the domestic landscape also is changing. Internal pressures and competition for US budget dollars in the face of a diminished threat, coupled with demands for a balanced budget, likely will lead to a more restrained, insular national preference with respect to the US role as a world power.

These international and domestic imperatives combine to present a unique circumstance for military planners. The international scene will become more diverse, more complex, and more competitive than ever before. At the same time, the pressure to reduce further US defense expenditures will continue. These cross-currents confront the Department of Defense with the challenge of meeting enduring interests and commitments while simultaneously shrinking military force structure and reducing forward presence. As I noted at the outset, I find this historic juncture of new security challenges and shrinking resources especially compelling given my mission of strategic nuclear deterrence. Because, of all the nation's military Commanders in Chief, I must keep a particularly wary eye on the receding era of East-West confrontation, even as I seek to exploit the benefits of an improved US-Soviet relationship in the interest of a greater contribution to future US conventional response capabilities.

NEW MILITARY STRATEGY

The new military strategy takes these considerations fully into account. While acknowledging a changing strategic landscape, the strategy recognizes that US fundamental security objectives largely remain constant. The realities are that, now and in the foreseeable future, the Soviet Union will remain the only nation with nuclear forces able to destroy the US, virtually within 30 minutes. Beyond this sobering reality, it is equally clear that the US will retain vital interests across the Atlantic and across the Pacific. Finally, we will continue to face the certain prospect of spontaneous, unpredictable crises that compel immediate responses to secure US lives and interests. These realities form the basis for the Chairman's Base Force concept—the linchpin of the new national military strategy.

BASE FORCE CONCEPT

The base force concept described in the President's fiscal year 1992 Budget provides a realistic vision of military needs in the post-cold war era, with its emphasis on sufficient forces and flexibility to meet enduring requirements and unexpected demands. It defines the minimum force levels, consistent with a shrinking defense budget, to meet the national military strategy and its objectives. The highest priority in the base force concept is the maintenance of nuclear deterrent capability. On the conventional forces side, the longstanding focus on global war with the Soviets is moderated significantly in recognition of the far greater likelihood of regional contingencies. The base force concept envisions the ability to protect worldwide interests with smaller, but highly responsive and flexible forces, operating from fewer bases and with reduced overseas presence. To meet these goals, it anticipates reshaping our military forces and tailoring them more specifically to enduring global realities. In addition, strong emphasis has been placed on the need for early, prepackaged options with existing forces (Measured Deterrence Response) and a flexible range of mobilization responses designed to quickly gear up US and allied capabilities in response to a prospective resurgent Soviet threat to Europe (Graduated Mobilization Response).

IMPLICATIONS FOR STRATEGIC AIR COMMAND

The new strategy and its Base Force have several implications for the Strategic Air Command. First and foremost, it introduces substantial change in SAC forces, modernization programs and contributions to warfighting. These directed changes combine with the lingering uncertainties of budget outcomes, basing structure, arms control and events in the Soviet Union, to make for an extremely complex leadership and management environment. Consequently, I have spent the bulk of my first weeks in office reassessing the corporate vision that has guided SAC for the 45 years of its existence. My conclusion is that while we are still on sound footing, both the seemingly interminable debate over strategic nuclear modernization, and the new realities of a changing world order, require a fundamental restatement of SAC's missions and requirements.

A FOOT IN TWO WORLDS

Like the new National Military Strategy, I must deal with both enduring and new realities equally momentous. My considered conclusion is that SAC's mission is best described in terms of not one, but two TRIADs. The first is the long familiar TRIAD of Nuclear Deterrence, with its overlapping, mutually reinforcing capabilities embodied in the bomber, ICBM and the Navy's SLBM forces. The second is the inherent but heretofore less emphasized contribution of SAC's Conventional Warfighting TRIAD, comprising again the manned bomber, plus the tanker and strategic reconnaissance forces. In the emerging global security environment, sustaining and when necessary enhancing the strength of these twin TRIADS is my principal responsibility as the new CINCSAC.

NUCLEAR DETERRENT TRIAD

The new national military strategy upholds strategic nuclear deterrence as the cornerstone of the nation's security. It recognizes that although the Cold War is over, the Soviet military establishment has yet to remove its overcoat. It remains largely insulated from the harsh economic climate affecting all other segments of Soviet life, in that modernization programs for strategic nuclear forces appear to continue unabated. Thus even at projected START I levels, these forces will constitute an undiminished threat in terms of their capacity to destroy the United States.

Conversely, despite this enduring reality, arms control prospects, Soviet unilateral initiatives, and the collateral benefits from other events in Europe, when considered as a whole, do allow for prudent reduction, reshaping, and reposturing of Strategic Air Command forces. However, this adaptation must take place within a coherent framework of national security strategy guidance, nuclear weapons policy, operational planning, arms control objectives, a balanced, supportable force structure, and, most importantly, modernization programs. I have examined each of these critical elements in great detail. I am persuaded that if the envisioned arms control agreement is achieved; and if the Soviet Union has indeed irrevocably abandoned its former hegemonic ideology; then the fiscal year 1992 President's Budget and its underlying national strategy will fully sustain the Nuclear Deterrent TRIAD capabilities of Strategic Air Command and the objectives of the SIOP.

CONVENTIONAL WARFIGHTING TRIAD

Given the greatly expanded role I envision for SAC's conventional capabilities, especially its bomber force, it is essential that I underscore the relevant implications of strategic modernization programs from this perspective. First, it is obvious that both tankers and reconnaissance aircraft play a vital role in both strategic nuclear and conventional arenas. Therefore, I am keenly interested in sustaining their contribution, particularly with regard to the KC–135 reengining program, which has my strongest support.

However, the role of the bomber in future conventional warfare can not be overstated. Its unparalleled responsiveness, payload and flexibility, coupled with a capability to range the globe from the United States without enroute or host nation support, make the bomber a unique and irreplaceable instrument of national power. For a variety of reasons, for the past 45 years, the inherent conventional role of the bomber has been called upon only episodically. The emphasis has been on its nuclear deterrent role. While that mission will continue to loom large for years to come, our new military strategy and the changing international security environment signal that it is clearly time to reinstitute the full conventional capacity of the nation's bomber fleet, especially as its numbers shrink in the years ahead.

ARMS CONTROL IMPACTS

I strongly support START objectives as the most rational approach to bounding and balancing Soviet and US strategic nuclear forces. Mutual, verifiable reductions of our respective arsenals are in the interest of all mankind. I fully concur with the negotiating emphasis on cuts in MIRVed systems in the quest for greater stability and survivability. With respect to US modernization under START, my personal priority is on the bomber force, given its dual contribution to nuclear deterrence and conventional warfighting. I also view it as of overriding importance to continue to preclude constraints on the conventional capabilities of bombers under present and envisioned START negotiations. The bomber must be permitted to carry a full range of conventional munitions whatever arms control constraints may be placed on its nuclear role and payload.

FORCE STRUCTURE AND MODERNIZATION

The forces at work in the new global security environment are powering a mighty river of change. Traditional views, doctrines, and tactics are being swept away by powerful currents. The river flow, swollen by quantum leaps in technological advance, and made more turbulent by shrinking fiscal resources, is driving towards entirely new concepts of warfare. Survival in this tumultuous caldron demands innovative military strategies, bold concepts of employment, and an imaginative new marriage of men and machines.

Against this backdrop, let me address specific strategic programs. First, I will briefly recap the plans for US strategic force structure under START, as contained in the fiscal year 1992 President's Budget. As you will see, the effect downstream will include the elimination of some forces altogether. Where prudent, we have reduced or stretched out forces to provide a dam of sorts against the tide. Finally, we have ensured that alternate channels are available as a hedge should the river suddenly change direction. Next, I will outline my priorities according to my vision of SAC's future role, building on my foregoing comments about the primacy of the bomber force. Third, I will comment on the portent of Soviet instability on arms control and modernization. Finally, I will touch on the consequences of the strategic targeting review for future weapons choices.

BOMBER PROGRAMS

The long range bomber is crucial to the new US national nuclear deterrent and conventional military strategy, with its acknowledgment of reduced forces and greater dependence on CONUS basing, even in the face of enduring global challenges to US interests and commitments and continuing Soviet nuclear capability.

NUCLEAR DETERRENCE MISSION

With regard to its nuclear deterrence role, the single most important contribution of the bomber is to hedge against the failure or reduced effectiveness of the land and sea based missile forces, whether due to a technological catastrophe or breakthrough, or a direct Soviet attack. Bombers also provide a key characteristic sought by both arms control and modernization efforts—stability. Bombers do not threaten a first strike, but rather afford a means of controlled escalation, or measured deterrence response. Moreover, bombers uniquely tax Soviet defenses, through a combination of flexibility, survivability and adaptability not found in the other nuclear deterrent forces. Thus, a modernized bomber force is essential to preserve the logic of the nuclear deterrent TRIAD in the face of ongoing Soviet efforts to upgrade every element of their own strategic nuclear forces at a pace that far exceeds our own.

The B–2 briefing and testimony received by this committee on 11 April 1991 highlighted the multi-faceted importance of this aircraft. The B–2 is the key to the nation's future strategic nuclear force posture. From every standpoint—the new national military strategy, START objectives and implications, upgrades in Soviet nuclear forces, crisis stability, and hedging against technological breakthrough—the B–2 is crucial. I am absolutely persuaded that it is the right system at the right time for the right mission. And what is that mission? It is multifaceted in keeping with the multi-role capability of the strategic bomber. Without the B–2, the capability of the bomber force to hedge the missile force becomes suspect, the Nuclear Deterrence TRIAD loses its synergy, hard target kill capability is reduced, and the perception of deterrence erodes. The B–2 is the system of choice as we enter an arms control era that emphasizes the contribution of individual weapons systems to enhancing stability. And finally, the B–2 will revolutionize the Conventional Warfighting TRIAD. It provides very long distance power projection, using the element of surprise and the ability to penetrate sophisticated or heavily defended targets while providing a massed and accurate gravity and/or guided weapons, capitalizing on rapid availability, operating virtually independent of support aircraft, and sustaining such performance over a substantial period of time. Any one of these—preserving nuclear deterrence, supporting START stability, or revolutionary conventional warfighting—is mission enough to deploy the B–2. The only remaining issue from my warfighter's perspective is, will it perform as required, and to date the answer is a resounding, "yes."

The B–1 is currently on alert fulfilling its nuclear deterrence mission. I have no doubt it can do that job effectively. Even with its acknowledged ECM, fan blade and antiicing problems, it is still the best operational bomber in the world today, especially when mated with a highly skilled SAC crew flying an exquisitely planned route designed to minimize exposure to an air defense system which has very likely been degraded by prior missile strikes.

I do not mean to overly minimize these three problems. They are real. They impose limitations. They are also fixable, and in my view, must be fixed. The B–1B is integral to a smaller but more effective bomber force for the 1990s and beyond. Yes, we've been on a maturation marathon with this airplane—but, we're down to 385 yards to go. This is no time to abandon the course.

The venerable B–52 is a classic example of the versatility and adaptability of a large, long-range manned aircraft. It is a tribute to American technology and doctrinal flexibility. Consequently, it can and will continue to play a key nuclear deterrent role, albeit from a posture that recognizes its growing vulnerability to Soviet air defenses. However, due to fiscal realities and the age of the engines and airframe, the ALCM carrying B–52G will be retired at an accelerated rate.

CONVENTIONAL WARFIGHTING MISSION

DESERT SHIELD and DESERT STORM have highlighted the extraordinary contributions of the strategic bomber with a display that finally fulfilled the vision and convictions of airmen going back to Douhet, Mitchell, Arnold, Spaatz and LeMay. Bombers reached their targets from bases that were relatively close and from locations thousands of miles away. They carried weapons ranging from WWII gravity bombs to the most advanced munitions. They attacked a wide variety of targets, from fixed facilities to the Republican Guard in the field. They helped track down and attack SCUD launchers. Ultimately, they dropped thirty percent of the tonnage rained on Iraq. Bomber crews were frequently given new targets enroute, and occasionally called off when targets became confused on a fluid battlefield. In short, every quality of the manned bomber came into play.

SAC tankers also were busy, offloading 1.2 billion pounds of fuel, serving as true force multipliers in extending the range of other aircraft. Likewise, SAC reconnaissance aircraft provided around-the-clock coverage that was instrumental to General Schwarzkopf in what he called "shaping the battlefield."

The new strategy anticipated this lesson of DESERT STORM when it called for conventional forces able to rapidly respond to a time-sensitive crisis providing long-range precision delivery before establishment of bases, before achieving air superiority and before air defenses are neutralized. I do not intend that this lesson be relearned on my watch as CINCSAC. The TWIN TRIAD is here to stay. The dual-capable bomber is not only back, it is manifestly the weapon of choice for a strategy and a command that must bridge the old and the new world order.

Providing the conventional capability which enables our strategic bombers to fulfill their dual role presents a particular challenge. When we design and then procure a strategic bomber, we get the basic airframe, the controls, displays, radars, computers and avionics for navigation, and a weapons control and delivery system, and enormous growth potential. Maturing the nuclear deterrent mission capabilities of a long-range bomber is relatively simple because the weapons and delivery tactics essentially are constant.

By contrast, the number and variety of conventional weapons, ranging in type and complexity from gravity iron bombs to standoff precision guided munitions, makes the development of a bomber's conventional capability more demanding. Like peripherals to a computer, each conventional munition must be carefully integrated with the bombers' systems. For conventional weapons, this means integrating the munition to the bomber with suitable suspension and release equipment; linking the munition to the bomber navigation and sensor suites with appropriate software; and, testing to determine how the weapon will behave when employed in the different aerodynamic environment of the bomber.

Though it is possible to anticipate some of these conventional munition requirements in the basic design of the aircraft, the extremely long life cycle of a strategic bomber means this integration process must be regularly repeated. We have done much to simplify the process through standardization, interchangeability of components, and designing sufficient space into new aircraft to allow easy accommodation of the integrating equipment. As a conventional warfighting weapon system, the strategic bomber's ability to grow and adapt to new technology makes it a particularly wise investment, unique among strategic weapons systems.

We are in the process of deciding which conventional weapons will be integrated with the B–2. I can assure you that the Air Force is committed to integrating both precision guided and gravity weapons to this remarkable aircraft.

ICBM FORCES

Nowhere is the downstream effect of change I noted earlier more apparent than in our ICBM force: some forces are eliminated completely * * * a number one priority yesterday becomes a hedge for tomorrow. I believe the ICBM force can and will grow smaller—while providing a substantial contribution to deterrence in accordance with the new national military strategy and START I objectives. Nonetheless, selective upgrades and modernization hedges are essential until the long term thrust of Soviet programs is better understood and follow-on START objectives are mapped out with the Soviet leadership.

The MMII force will retire by the end of fiscal year 1997. The timing of the phase-out is keyed to the pace and prospects of an incipient START treaty.

A fully capable MMIII force remains the centerpiece of the ICBM force. Funding for the MN Integrated Life Extension Program, in order to maintain launch and launch control facilities to their design specifications, is essential.

Plans to rebase 50 Peacekeepers in the rail garrison mode have been put on hold. This is a fiscally prudent step, notwithstanding the continuing Soviet move to greater mobile basing of their ICBM—so long as the modernization programs outlined in the fiscal year 1992 President's Budget proceed apace. The logic of deterrence does not require perfectly symmetrical force postures, but it does require adequate capability to execute national strategy. A modernized nuclear deterrent TRIAD will sustain that strategy for the foreseeable future without a mobile ICBM force.

As I have outlined, our ICBMS will continue to provide deterrence in a TRIAD context as we proceed with modernization and arms control. If needed, ICBM mobility is adequately hedged for the future. In my view, bomber modernization is a far more compelling need, especially given its multi-role capability.

The small ICBM is, in my view, the best option to hedge against long term requirements to replace the MMIII and to introduce mobility into the ICBM leg of the nuclear deterrent TRIAD.

AIR-LAUNCHED BOMBER MISSILES

The Advanced Cruise Missile makes an enormous contribution to bomber survivability and effectiveness. It has my strongest support.

The Short Range Attack Missile II program preserves a key aspect of bomber flexibility in the nuclear penetration role. Funding for continued development and testing should be supported.

Conventional standoff missiles with pinpoint accuracy are the ideal weapon for the dual capable bomber. In DESERT STORM we saw the forerunner of the type of PGM that is absolutely essential to sustain the irreplaceable role of the manned bomber to conventional warfighting well into the next century.

COMMAND, CONTROL AND COMMUNICATIONS [C^3]

DESERT STORM dramatically underscored the need for C^3 to operate, control, and manage forces from takeoff to target to recovery. The MILSTAR program provides just such capabilities. Restructured to better support conventional operations, MILSTAR has applications on all SAC aircraft: from bombing to reconnaissance. Thus, the restructured MILSTAR program is a perfect fit to SAC's twin TRIAD of Nuclear Deterrence and Conventional Warfighting. Completing the Groundwave Emergency Network (GWEN) will ensure I have the ability to communicate with SAC deterrent forces—even while under attack. Once the National Academy of Sciences completes its review, your help is essential to quickly release the funds to continue land acquisition and relay node construction.

NUCLEAR WEAPONS INFRASTRUCTURE

To meet future weapons requirements, albeit at lower overall levels, and to implement the Drell Panel's proposals on nuclear weapons safety, the US needs a healthy, viable, and safe nuclear weapons production complex. Especially critical are the Rocky Flats Plant and the Savannah River site. Without these production facilities, it may be impossible for the US to implement its planned nuclear modernization and recommended nuclear safety programs.

GOLDWATER-NICHOLS DEFENSE REORGANIZATION ACT

The 1986 Defense Reorganization Act can take important credit for the enormous success of Operations DESERT SHIELD and STORM. The increased authority of the supported CINC left no question about who was in charge. From the SAC perspective, the impact of the 1986 Act was most apparent in the ease with which CINCSAC, as a supporting CINC, provided bombers, tankers and reconnaissance assets, to include operational control of the bombers, to the theater commander. The "chopping" of these bomber assets to a theater commander was precedent setting for SAC. Under this arrangement, some 70 bombers flew 1,600 sorties under the operational control of the theater commander. Further, SAC reconnaissance aircraft flew 1,200 sorties and helped provide 24 hour a day coverage of the Gulf area. SAC tankers supported both CINCCENT and CINCTRANS, offloading a billion pounds of fuel. This extraordinary effort was provided without a hitch related to operational control of the aircraft.

PRIORITIES

Finally, let me say a few words about my priorities. First, and foremost, my top priority is people—130,000 of them. As I watched the first of 16,000 SAC people return from the Gulf, it was a pointed reminder that ultimately, to quote General George Patton, "wars are won by men, not machines." In this day and age, I need only update General Patton's words and say, men and women.

My second priority is readiness, because my mission never stops. Nuclear deterrence is a 24-hour-a-day, 365 days-a-year mission. And, conventional power projection and/or warfare is something I might be called on to do at anytime. The vigilance of SAC must not diminish one iota.

Modernization is my third priority because it is the key to sustaining the capabilities that underwrite the TWIN TRIAD of nuclear deterrence and conventional warfighting.

Lastly, but in some respects most importantly, is the development of an intelligent and efficient Single Integrated Operational Plan. This task, to develop a target list on which nuclear weapons may be placed in wartime, is the most sobering of all my responsibilities. Secretary Cheney and General Powell have taken a close look at our strategic targeting policy and associated war plans, and made a number of significant modifications that reflect the evolving world situation and establish tighter linkage between policy guidance and employment planning. I was closely involved with this review as the Director, Strategic Plans and Policy. Now, as the Director, JSTPS, I have conveyed to my staff the conviction that I intend to review the entire process to ensure that every weapon and every target is fully in keeping with the guidance and that it passes my logic check with regard to each target and each weapon. Such a check must be done to ensure that the SIOP not only meets guidance from the President, Secretary of Defense, and Chairman, JCS, but also that it is consistent with arms control objectives and proposed constraints while also being consistent with force structure and modernization programs. In that regard, let me stress that the SIOP is not driving US nuclear force requirements. Rather, it is one factor among many which collectively determine the appropriate size and posture of the strategic nuclear arsenal.

In conclusion, the fiscal year 1992 Presidential Budget for the Strategic Air Command is based on vital national interests, the changing landmarks that identify and threaten those interests, a new strategy that accounts for enduring and emerging realities, and the realities of a declining defense budget. I believe that the most important priorities of the Strategic Air Command, priorities essential to provide the TWIN TRIAD of nuclear deterrence and conventional capabilities, have been met in the fiscal year 1992 budget request.

Senator INOUYE. Thank you very much, General Butler.

As you said in your remarks a few moments ago, your prepared statement says essentially the same. I quote, "The B–2 is the key to the Nation's future strategic nuclear force posture. From every standpoint the new national military strategy, START objectives and implications, upgrades in Soviet nuclear forces, crisis stability, and hedging against technological breakthrough, the B–2 is crucial."

I am certain you realize that the B–2 is the most controversial weapon system that we will have in our consideration. Many of my colleagues in both houses are vehemently opposed to this. Why are you so positive about the B–2?

AMERICAN NATIONAL SECURITY

General BUTLER. First, Mr. Chairman, let me say that it is perfectly understandable that such a revolutionary and relatively expensive airplane would be the subject of great controversy, particularly in a period where budgets must be brought into balance and when our most compelling threat over the years, the Soviet Union, has clearly undergone some sort of profound transformation.

But, in answer to your question, I would underscore the following. It is essential to have a broad strategic perspective in which to place the capabilities of a platform like the B–2. For me that perspective is very clear. It is the dramatically changing circumstances for American national security.

I believe the following in that respect. No. 1, that this Nation will continue to have vital, global interests and obligations. I take that as a given because we are a great power and I see no change in that role.

No. 2, our forces are going to be smaller and they are going to be based mostly in the United States. What that says is that under their present capabilities that we have operated in the past, we are going to lose flexibility. Smaller forces and continental United States basing equates to reduced flexibility.

Consequently, we will be more dependent than ever in my estimation in regaining, recouping that flexibility through the avenues of the thing that we do best in this country, and that is to bring technology to bear on the battlefield equation.

As I look at the world, as I see it emerging, where Europe is relatively quiescent, where the Persian Gulf and the Middle East will continue to be greatly unsettled, where Korea is still unresolved, and where the rest of the world still gives rise to spontaneous crises that involve lives and property and vital interests of the United States. How, in the future, 5 years or 10 years down the road, will the United States respond quickly to some sort of 48-hour, come-as-you-are, crisis where we do not have local basing, where we might not enjoy en route support?

That is why I underscore the new strategy for which I was one of the principal authors. It puts a premium on highly flexible, mobile, and capable forces, and I believe that that environment emphasizes the kinds of capabilities that are brought by long-range manned platforms, and foremost among those, the bomber.

B–2 TECHNOLOGY

That is why I see that the kind of technology that is inherent in the B–2 to be so important. Because in that future world where a platform has to go 6,000 miles or 7,000 miles with no en route support and carry a variety of conventional munitions in order to stop a variety of aggressions, a bomber which can operate from the United States, do that job, and return with virtual assurance of mission success is absolutely key to the new strategic vision.

Senator INOUYE. That is what you mean by weapon of choice, I would presume.

General BUTLER. One of the most appealing qualities of the bomber, Mr. Chairman, is that it can carry a variety of weapons. In the nuclear deterrent role, of course, it carries nuclear weapons. But in the conventional arena it can carry a whole host of weapons ranging from, for example, what we call gravity bombs, in a denigrating fashion, dumb bombs. But the B–2 makes them very smart because of its inherent navigational accuracy.

The airplane is also baselined to carry a precision guided munition of classified capabilities. It can carry a whole host of conventional weapons such as mines, sensor-fused weapons, and others which give it the capacity to do everything from attack very large area targets to scattering mines in the path of an advancing force, to launch ammunition with great precision against point targets of high strategic value; that is, to the enemy's campaign, whether it is the heart of his command and control system or his ability to manage his forces on the battlefield.

So from that perspective, Mr. Chairman, as much as our bomber did in the gulf where it attacked large area targets, where it attacked Republican Guard in the field and decimated their morale and much of their equipment, where it was involved in the Scud campaign, where it breached paths for the Marines to cross into Kuwait, and where it even dropped leaflets, the bomber platform will always bring a very multifaceted dimension to conventional warfare.

B–2 COST

But to be that successful in the future, it must be able to do it with virtual autonomy and impunity over the battlefield because it may have to do it alone.

Senator INOUYE. I believe you have identified the major cause of the controversy of the B–2 and that is the cost.

That being the case, there are many who respond that the Air Force will never risk such a costly aircraft on conventional weapons and that the B–2 is gold-plated for any likely future conventional threats. How would you respond to that?

B–2 BUY

General BUTLER. I have never understood those arguments, Mr. Chairman. We build weapons systems in order to employ them in the circumstances where they might be needed. The question implies that the Air Force will not use the weapon. Of course, the Air Force does not employ the weapon; regional warfighters do that now under Goldwater-Nichols.

General Schwarzkopf was the warfighter in the gulf. He asked for B–52 bombers. We sent him 33. He asked for more. We sent him 38 more. Had he wanted additional bombers to that, we would have sent those as well.

The issue is not so much the cost of the platform as its utility on the battlefield. In that war, B–52's were adequate to do the job, but we had air supremacy. They still required a supporting armada of defensive aircraft. The B–52 was an expensive platform in its day and it carries a valuable crew.

The B–2 is expensive. But what is more important is the return on the investment. The B–2 is an airplane which can operate, which can survive over a future high-intensity battlefield and do the Nation's bidding, and do that with great assurance and high survivability. That was the whole purpose of the airplane.

If I had to draw a parallel, we put carriers and their aircraft, a very expensive set of platforms, at risk by sailing into the Persian Gulf. No one was unmindful of the fact that there was risk associated with that and that these were expensive platforms. But that was quite beside the point. The issue is that General Schwarzkopf needed those platforms to be there to do a variety of jobs.

So I just simply cannot accept the argument, Mr. Chairman, that we will not use capable platforms to do whatever necessity is required.

As for goldplating, I do not understand that argument, either. The capabilities that are in the machine are there for a reason. Stealth is there to give the airplane impunity. The F–117 went against the toughest targets and we did not lose a single aircraft. That is unheard of. That is unprecedented in modern warfare. The B–2 is essentially a large F–117. It can carry five to six times the payload over 5 to 10 times the range, depending on how many times you want to refuel the aircraft.

Consequently, I would have absolutely no reservation. In fact, I think a theater warfighter would find it greatly to his advantage to have a machine like the B–2 at his disposal because of the enormous increase in capacity, range, high survivability, and flexibility that the B–2 gives him in order to attack a wide variety of targets.

So I simply cannot accept those arguments, Mr. Chairman.

Senator **Inouye**. Some of my colleagues are suggesting that we should limit the buy to 15 B–2's. In your mind, would that be prudent, either for nuclear or conventional missions?

General **Butler**. No, Mr. Chairman; 15 is simply not a viable operational force. It would be very difficult to imagine an operational concept that made sense for 15 aircraft.

Senator **Inouye**. Because of budget problems, some will be talking about priorities. If it becomes necessary to do a little fiddling, you have supported the B–2, the advanced cruise missile, improving the B–1B, maintaining the Minuteman III, the tanker upgrades, the question may come up, are you willing to have the $1.5 billion needed to upgrade the B–1B be set aside for the B–2?

General **Butler**. That is like asking me to choose between my children and my grandchildren, Mr. Chairman.

Both aircraft play a very valuable role. I do not size my force necessarily to a dollar cost, although I have to take it into account. I size it to an operational and warfighting requirement.

For example, when I develop the single integrated operational plan to hedge against the terrible prospect of nuclear war with a nation like the Soviet Union, I build a force structure based on the demands of the strategy and the tasks that I am given.

By the turn of the century we will be down, even with a full B–2 buy, to something on the order of 250 bombers. That is the smallest bomber force structure that we will have had in the history of my command. That puts a great strain on my ability to do what my task requires, and that is to put a weighted and balanced attack in the SIOP, weighted and balanced, from the standpoint of having adequate capabilities in ICBM's, SLBM's, and bombers so as not to have all our eggs in one basket.

Consequently, when I look at the shrinking bomber force and I look at my requirements to develop a SIOP, setting aside conducting a meaningful conventional campaign, the bomber force is already coming down to levels that I am going to find very difficult in terms of proper utilization.

From that standpoint, I would not know how to choose between the B–2 force and the B–1 force. I need the capabilities that both bring, not only to nuclear deterrence, but conventional warfighting.

B–2 WEAPONS LOAD

Senator **Inouye**. I gather that there is a study going on at this time on the use of conventional munitions and smart bombs on the B–2. When will that study be completed?

General **Butler**. There is a study in the sense that we continue to evaluate the utility of the platform across a whole variety of weapons.

But let me quickly say that in the baseline capability of the aircraft, Mr. Chairman, that is to say what we have already bought and paid for in the program as we envisioned it, comes, one, the capacity to carry a wide array of conventional munitions, 500 pound, 1,000 pound, 2,000 pound gravity bombs, mines, and advanced conventional munitions like sensor-fused weapons, for example.

Included in the baseline of the airplane is the capacity in avionics, in the equipage fundamental to the bomb bay, the other mechanics of dropping weapons. We have baselined a capability for precision-guided munition. These capabilities are still classified. We are also exploring using this platform to drop highly precise munitions of the kind that you saw delivered in the Persian Gulf. That is still under addressal.

There is a rich menu of conventional capabilities which are either in the baseline plan or which can be added to it for what I consider to be a relatively modest price, something less than 5 percent of the fly-away cost, Mr. Chairman. So it is a rather complex question, but it is one we continue to explore with great vigor.

B–2 FLIGHT TESTS

Senator INOUYE. Before I turn to the vice chairman, my last question, and I will be back again. Are you satisfied with the results of the flight test to this moment?

General BUTLER. Absolutely. The flight tests have been very gratifying from the standpoint of air worthiness.

I have not flown the airplane itself, Mr. Chairman. I have flown the simulator, which is quite faithful, and the test pilots tell me the airplane flies even better. The simulator flies like a dream. I have done a complete mission profile in the simulator and I was astonished at the handling qualities of the machine.

Second, we have had no anguishing surprises with regard to the flight test program; third, and most gratifying, is that the initial tests of low observability have proven out our expectations with regard to engineering predictions.

So that is the good news story, Mr. Chairman.

Senator INOUYE. Certain problems have been identified by the contractor and by the Air Force. Are you satisfied with the way it has been addressed?

General BUTLER. I am indeed. I followed that very closely as the potential user of the airplane. I do not want an airplane that does not meet specification and will not do the job for me. So I have a keener interest than anybody in how the airplane proceeds in its testing.

To date, the kinds of problems that have been identified are not unusual engineering problems and can be fixed with straightforward engineering changes.

Senator INOUYE. Now I am pleased to call upon my vice chairman, Senator Stevens.

Senator STEVENS. You are very gracious, but our friend from Louisiana who is busy at the moment, was here first.

Senator JOHNSTON. I would be happy to yield to the vice chairman.

Senator STEVENS. Go ahead.

Senator JOHNSTON. Thank you very much, Mr. Chairman.

General Butler, I want to, first of all, remark about your terrific ability to predict what was going to happen in Desert Storm.

General Butler came by to give me a briefing, Mr. Chairman, just 2 days before the air part of Desert Storm started, and outlined the challenges, the situation in Desert Storm precisely, exactly, and with such precision that it gives me great confidence that he's now the commander of SAC.

General BUTLER. Thank you.

SOVIET BUILDUP

Senator JOHNSTON. General Butler, what degree of confidence do we have in what the Soviets are doing? You pointed out that they are continuing to build up. What degree of confidence do we have that that is correct?

General BUTLER. We have entered, perhaps a more puzzling environment than ever, in my estimation, Senator, with regard to trying to understand what is happening in the Soviet Union and where they might be going. Obviously, the political situation is in great turmoil. I am not sure that the Soviets have any real sense of what outcomes in their country may be.

The one thread of continuity that we see is that despite the political turmoil and the fact that their economic system is in chaos and that they may be sliding into some sort of catastrophic failure in this regard, they continue to make, what we would consider, enormous expenditures on defense. I do not want to overplay that. I do not know how much momentum those programs have. I do not know how long they can sustain that.

On the other hand, in my current duties as the Commander in Chief of Strategic Air Command, I do not get paid for speculating about Soviet intentions or outcomes. I get paid for measuring their capabilities and puzzling through how I am going to do my job, which is to maintain to 100-percent assurance, a nuclear deterrent posture that guarantees that this country will never be faced with either the threat or the reality of nuclear attack.

The only way I know how to do that is in keeping with my guidance, which says maintain a posture that under any circumstance of war or initiation can render a devastating reply. So it should not be surprising that that's where my attention is focused.

But with respect to a judgment about outcomes in the Soviet Union, I simply cannot give you that. I think it is very problematic at this point.

B–52 IN DESERT STORM

Senator JOHNSTON. All right. Turning now to the B–52, you pointed out that during Desert Storm and Desert Shield that the B–52 had to operate above its predicted envelope, which I understand was above 20,000 feet, was it?

General BUTLER. About twice that.

Senator JOHNSTON. Twice that?

General BUTLER. We bombed from 35,000 to 40,000 feet.

Senator JOHNSTON. I see. And that was above all the flack and AAA.

General BUTLER. Indeed. The principal threat, interestingly, going back to World War II, was AAA. That is what drove us out of the low-altitude envelope. We still faced a SAM threat, even at

35,000 or 40,000 feet. In fact, one of my airplanes took a SAM hit. I got a debrief from that crew just last week. The aircraft commander was an old head from Vietnam who said, "Aw shucks, coach, it was not much." But his young crew still had very large eyeballs from having taken a SAM at 40,000 feet. And so, yes; it was a very real threat.

Senator JOHNSTON. Well, AAA cannot get up that high.

General BUTLER. That is why we went up. That is principally why we went up, to get out of AAA.

Senator JOHNSTON. Now, as you know, I am a supporter of the B–2. What envelope would the B–2 have been able to operate in Desert Storm?

General BUTLER. The envelope of its choice. Anywhere from very low altitude to medium or high altitude if it needed to do that to conserve fuel. That is the beauty of stealth technology. It brings that flexibility back to the operation of the platform. It opens up a whole new array of tactics that are essential to attacking a wide array of targets and it can do that with virtual assurance of success.

I do not know if you had an opportunity to watch the testimony of those young F–117 crews before the House Appropriations Committee last week, but they said on their first mission, they were very nervous. They were concerned because all of the stealth business was theoretical. It had all been done against operational tests, radars. But on the second mission, they knew that they were not going to be touched. That is why those airplanes went into the teeth of the defenses against the toughest targets and did that without a single loss.

Senator JOHNSTON. At what altitude did the 117 operate?

General BUTLER. That is classified, sir. I can provide that for you in closed session.

Senator JOHNSTON. Well, I guess my question is——

General BUTLER. But the point is, lower, much lower.

Senator JOHNSTON. The B–2 could operate at 10,000, for example?

General BUTLER. Absolutely; no question.

Senator JOHNSTON. And that is because the AAA depends upon radar guidance.

General BUTLER. That is correct; otherwise they just fire wildly in the air. And that is not a very effective way to operate AAA, although the Iraqis did that as well.

But even with these desperate measures that they took—barraging SAM's, firing AAA wildly—they still did not touch an F–117. Ground radars that are tied to either SAM's or radar-laid AAA are not effective against stealth platforms.

AIR FORCE BASING

Senator JOHNSTON. Now General Butler, what do you expect the Air Force to look like in terms of bases 10 years from now? Domestic.

General BUTLER. From the domestic side, speaking from the standpoint of my command, 2 years ago, we had 24 main operating bases. Now I have 22, and in the latest base closure effort, I lose

6 bases. If those bases are, in fact, closed, I will be down to 16 in the continental United States.

But of greater concern than that, of course, Senator, is the fact that our overseas bases may face increasing constraints. Outcomes in the Philippines are also problematic at this juncture. It is interesting that the posture we had envisioned in 1996 or 1997 in Europe, with a lot of caveats, was a corps with two robust divisions. We reached that posture in November of last year, when we pulled the 7th Corps out and sent them to the Persian Gulf. So I do not know what opportunities I will have in the European continent, depending on outcomes in Europe and the future of NATO.

So from every respect, my future is uncertain with regard to access opportunities for forward support, much less basing in a region of conflict that is vital to U.S. interests. I see shrinking flexibility in that regard.

Senator JOHNSTON. Well, 16 bases, is that just a way station on the way to a smaller amount in the United States?

General BUTLER. Sir, that is in your hands here. I could not predict that. But if the budget problems continue, if there are increasing pressures to reduce overhead—across the Government, not just the Department of Defense, but we share in that—then I certainly cannot discount the fact that I may have fewer bases. I will do whatever is required.

Senator JOHNSTON. From a military standpoint, you do not have a minimum number that you would recommend to us?

General BUTLER. No, sir; that really depends on my force structure. It depends on how many airplanes I have. I do have a calculation that I make with regard to the maximum number of airplanes that it makes sense to put on a base. We call that base loading, and optimum is about 86 percent to 89 percent.

With my current force structure, and if I lose these six bases, I will be at 90-percent loading in Strategic Air Command. Which says that is about as low as I would like to go. Otherwise, I get into very difficult day-to-day maintenance situations of having to tow airplanes around from one parking spot to another because I just do not have room for them all.

Senator JOHNSTON. Well, as I understand it, the Army has fairly clear and definite plans to have phase 2, phase 3, phase 4, of base closings that are going take place in the next 3 or 4 years. That is not so with Strategic Air Command?

General BUTLER. It is true only from the standpoint that when my prospective bases were announced for closure, my six, they were laid out over a period of time, fiscal year 1993, fiscal year 1994, and fiscal year 1995. So from that standpoint, there is a phasing involved.

Senator JOHNSTON. But that pretty well includes everything that is contemplated at this time.

General BUTLER. That is correct.

Senator JOHNSTON. Thank you, Mr. Chairman.

Thank you, General Butler.

Senator INOUYE. Thank you very much.

Senator Stevens.

Senator STEVENS. General, I came in slightly late, and I apologize for that, but I do not think I have heard this conventional triad spelled out the way you did today. How does that reflect into your current training now? Is there a change in your training to meet this twin triad concept?

CONVENTIONAL WARFIGHTING

General **BUTLER**. It would expand the training that I give my bomber crews for conventional warfare, Senator. That is not a great change. Dropping a bomb or firing a missile is the same in many respects, whether it is nuclear or conventional. However, curiously, conventional warfighting tactics tend to be far more complex than nuclear warfighting tactics, if you will, where the bombers fly rather set, precise routes, which have been carefully gauged in advance in order to avoid Soviet defenses and we know a great deal about the Soviet Union.

One of the difficulties that we faced in the gulf, when we went to that region, is that among other things, it simply had not been mapped. We did not have precise maps in order to do all the exquisite targeting that is required for cruise missiles, for example. Or just for the routing of our crews. We had a lot to learn about the disposition of Iraqi forces in Kuwait, about their integrated air defense network, for example.

Now, when you have to fight a war and go into the teeth of defenses that you do not understand very well, that is a far different matter from this highly structured set piece war that we lay out in the SIOP. And so, from that standpoint, we had to teach our crews to be very flexible, very adaptive, and lay out for them a variety of tactics for a whole array of weapons.

So from that standpoint, conventional warfighting is far more demanding than nuclear warfighting, and that requires additional training.

Senator **STEVENS**. Well, what does that mean to this committee in terms of budget. Will there be much change in your budget in the fiscal years 1992 and 1993?

General **BUTLER**. It means I would need some additional help in O&M funding, Senator, for the additional flying hours required to train those crews, as well as the practice munitions and those kinds of things.

Senator **STEVENS**. Does it affect the priorities as far as aircraft acquisition?

General **BUTLER**. No; but it would require me to make some internal adjustments in Strategic Air Command to my own priorities.

ICBM MODERNIZATION

Senator **STEVENS**. When Secretary Rice was here, I raised the question about the termination of the MX and relying on a future Congress to provide the small ICBM. Have you reviewed that situation? I do not think I have had the opportunity to discuss it with you. But does it really make sense for us to end production of our MX and rely upon a future Congress and administration to come forward with the basic system that would be required by the new START Treaty?

General **BUTLER**. With respect to maintaining options for ICBM modernization, I have to be uneasy about any action that forecloses options, perhaps irrevocably, although the program would have us do one demonstration test of a Peacekeeper missile from a rail mobile configuration, and then shelve that option and bring it back in the event that it was needed.

I understand the logic behind that, but keeping that option alive in an increasingly difficult fiscal environment, I think, will be very challenging. On the other hand, choosing between Peacekeeper on rails and the new small ICBM, I am inclined to favor the latter. I think it gives me the same hedge for mobility and the missile could also be based in a Minuteman silo if we elected to go that route. And so, I think that is an important additional option to have. But yet, I know, Senator, that it was a very difficult choice. I support it because it is fiscally driven. If we can only have one option, then I support the hedging option for the new small.

Senator STEVENS. I think we support, at least, most of the people I have talked to here support that concept, too, but I have a worry about ending an existing system and relying upon someone to keep a commitment in the future when most of us will not be here, to deal with the concepts of the first decade of the next century, providing the new ICBM, what about the relative cost of your life extension program for Minuteman, as opposed to maintaining a smaller rate of production on the MX?

I want you to understand, I do not have any MX production in my State. I am sure you realize that. I am talking about security now, in terms of the future. Where is our security if we stop production of MX and rely upon the future generations to come in and authorize and initiate the production of the small ICBM that we all think is preferable?

General BUTLER. With regard to continued production of the Peacekeeper missile, terminating that line, my gravest concern there is not so much the Peacekeeper as a continuing hedge against increased deployments of that particular missile as it is against being able to do adequate testing to ensure the future reliability of the missile itself. That is an integral part of deterrence.

We have taken a calculated risk with regard to stopping production of the Peacekeeper, because that will reduce our ability to test from seven to three shots a year. I have looked very carefully at the risks entailed in that, and I accept them with reservations. That is, I would prefer to test at the higher rate. But there is an enormous savings, over $2 billion involved, by reducing the number of test shots.

Second, with regard to hedging it for future modernization, if, in fact, our arms control strategy is to emphasize the elimination of what had been billed as the more destabilizing weapons; that is, ICBM's, I have to accept the reality that the Peacekeeper itself may find its way onto a table in some future arms control negotiations beyond START. So, as I think about the very best prospect in the future, it would be a single RV weapon that has both a mobile- and a silo-based configuration. That is why I tilt toward the new small as the preferred option.

But I am concerned that I have had to reduce the amount of testing for Peacekeeper missiles from seven to three because we have stopped production of that missile.

Senator **Stevens**. Changing the subject, did you participate in the decision to disassemble the over-the-horizon radar in Alaska?

General **Butler**. No, sir; I didn't.

Senator **Stevens**. Well, I raised this question before and I raise it with you, I think. I do not expect an answer now. I did not protest that disestablishment because of the budget restrictions, but I note that the OTH in Maine will be maintained and the OTH in Alaska will not be, and yet the continued growth of the Soviet forces is in the Soviet Far East and Siberia, where the Alaska OTH could have maintained surveillance.

And I just wonder whether that was a proper decision and, from your point of view, I would urge to check into it.

General **Butler**. I will indeed.

TANKER FORCES

Senator **Stevens**. Let me ask you just a couple of other short questions. You have a tanker task force in Alaska at Eielson. Is it your plan to maintain that task force as you reduce deployment worldwide?

General **Butler**. At this time it is, Senator. I still have several very important missions that I support up there. As you know, two of them are classified, and I also have fighter aircraft up there that have to be refueled.

So for the time being, I do not see any alternative to keeping Strategic Air Command tankers based up there to do that job.

Senator **Stevens**. We talk about the dual deployment capability of assets in Alaska going over to the Far East as well as going into the European theater. Is that implied in your tanker task force also?

General **Butler**. Yes; there are a number of airplanes which could well, according to the scenario, deploy across the northern route and they would require air refueling.

Senator **Stevens**. Are you familiar with the growth of the Alaska Air National Guard tanker task force now?

General **Butler**. I am.

Senator **Stevens**. Is that complementary to your mission or——

General **Butler**. It is, and it may give me some relief in the future, Senator. As you know, in the President's program, we are retiring 75 KC–135–A models, the earlier versions. Additionally, by the time that program is complete, over one-half of my tankers, 52 percent—if you will excuse the expression, my tankers—the Nation's tankers will be in the Guard and Reserve.

Senator **Stevens**. We like that, your tankers. I think if you think they are yours you will take better care of them. [Laughter.]

General **Butler**. I have a certain proprietary interest with them.

MOBILE LAUNCHERS

Senator **Stevens**. The chairman and I spent a lot of time getting briefed when we were in the Persian Gulf area on the problems of tracking mobile launchers.

Has that experience led to any investigation, any type of research in how we might be able to do that better in the future?

General **Butler**. It has indeed. No. 1, that mission proved just as tough as we always surmised that it would. It is very difficult to track down mobile missile launchers. We employed a variety of techniques in the gulf to ultimately do that job.

I think it is useful to underscore here that the most successful techniques came down to very high-technology platforms like JSTARS for example.

Senator **Stevens**. You are on JSTARS. But I just wonder from the point of view of our strategic capability, whether we had any more plans to find ways to track those?

General **Butler**. I continue what I would call a level-of-effort investment with a variety of research organizations, trying to improve our techniques, capabilities for the bomber to do that job.

In fact, in the Persian Gulf, B–52's were employed in the SCUD campaign. With respect to doing that job in the Soviet Union, what has commonly been referred to as finding strategic relocatable targets, even with a B–2 platform, which could do it with some additional survivability, that is still a very difficult and daunting prospect.

So, we look for the technological breakthrough, the magic solution, Senator, but we have not found it yet.

SR–71

Senator **Stevens**. Last question, and I, again, have no provincial interest in it, but just from the point of view of an intellectual concept, what about the SR–71 after the experience in Desert Storm? Should we resurrect it?

General **Butler**. It is pretty old technology, Senator, and a very expensive platform to operate, particularly with reducing systems.

Senator **Stevens**. What do we have to replace it in the future Desert Storm type of operation?

General **Butler**. It may be that with the new technologies that are coming along, both from overhead and open and compartmented programs and new platforms like JSTARS and the wonderful work that my U–2's and TR–1's and RC–135's did, that we will have adequate coverage for the time being.

But we do miss the synoptic——

Senator **Stevens**. Is not the U–2 sort of an old technology too, General?

General **Butler**. It has been around about as long as I have been in the Air Force——

Senator **Stevens**. As long as I can remember almost, but I thought that perhaps we would resurrect the SR–71 and try to eliminate some of the cost factors of it. That is not possible?

General **Butler**. Sir, I think what you see is what you have got. You have got an extraordinary platform that was very expensive to operate and maintain, and I have to believe that the extraordinary advances we have made in technology over the last 3 years offer an opportunity to do that job, at least as well, hopefully better, and with a modern system that we will not have to continue to pump money into just to keep it in the air.

I understand where you are coming from though. It is a magnificent machine and I keep a picture of the SR–71 on the wall right in front of my desk. It is nostalgia, I suppose.

Senator **STEVENS**. I have one in my study. I think it was one of the finest airplanes we ever built and I thought, perhaps, it might be resurrected in Desert Storm, but as I understand it, it was not.

General **BUTLER**. We got the job done without it. It was not easy.

Senator **STEVENS**. Thank you very much, Mr. Chairman.

Senator **INOUYE**. Thank you.

Senator Specter.

Senator **SPECTER**. Thank you, Mr. Chairman.

General, I would like to continue on the brief discussion we had before the hearing started.

General **BUTLER**. Yes.

B–2 COST/CAPABILITY

Senator **SPECTER**. Let us turn to your evaluation of the desirability of the B–2, which costs in the range of $850 million a copy. At a time when defense dollars are very short, and the experience in the gulf war has shown, at least to my view, the need for rapid deployment, how would you justify continuing the B–2, considering its expense and the problems which we have found with it?

General **BUTLER**. I guess I would characterize it in terms of return on investment, Senator, and I do not at all diminish the expense of the platform. I understand sticker shock, and so when I look at what it would mean to the Strategic Air Command to own and operate a platform like that, I have to be very cautious in my own assessment.

But having watched the performance of the stealth platform in the gulf, and having concluded to date that if what we see in early testing continues, that the B–2 is effectively a B–52 size F–117.

What that brings to my command in terms of offering a conventional warfighter to someone like General Schwarzkopf is an F–117 with much greater range, much greater payload, and the same survivability, but which can operate like the F–117, with less risk to the crew, but also with greatly reduced requirements for host nation support and most importantly, the armada of supporting aircraft that are necessary to go along with large vulnerable platforms or even with fighters.

For example, two B–2's could have done the job of eight F–117's in terms of the kind of payload that the F–117's were carrying: two 2,000-pound bombs with high-precision delivery capabilities.

They could have done that without the need for any tankers, without any backup support whatsoever, and, if necessary, they could have done that from the United States. That would have been a desperate measure for that war, but it could have been done.

Senator **SPECTER**. May I interrupt you at that point, to ask you just one more followup question, because I am due at Judiciary in just a few minutes.

General **BUTLER**. Please.

Senator **SPECTER**. Additionally, I would like to submit some questions for the record, if I may, Mr. Chairman.

Senator **INOUYE**. Without objection.

Senator **SPECTER**. Much of the justification for the B–2 derived from the proposition that we would use it to seek out the mobile ICBM launchers from the Soviet Union. I note that in the Department of Defense 1990 brochure on Soviet military power, at page 51, there is a statement that the "proportion of mobile ICBM launchers likely will increase to about two-thirds of the total ICBM force, giving the Soviets a more survivable force."

My question goes to the ability of the B–2 to find such mobile forces in light of the inability of our Air Force to find the mobile missile launchers in the gulf war which proved so problematic to Riyadh and Israel.

General BUTLER. Let me speak to that in two parts, and I will do so quickly. No. 1, with regard to mobile targets in the Soviet Union like their missiles, there are many more types of targets, my guidance is very demanding, Senator.

It says that I cannot give the Soviets sanctuary for their mobile systems. I have to make an effort to seek out targets and attack their systems even though they are mobile.

Second, however, that is an extremely demanding task. Third, as among ICBM's, SLBM's, and bombers, only the bomber can do that job. I cannot do it with missiles.

Senator SPECTER. But, can the bomber do it?

General BUTLER. The bomber can do it with great difficulty. In private session, I can provide you some assessment of how well we can or cannot do that task.

Senator SPECTER. Do you think you can find mobile Soviet launchers better with the B–2 than you did finding mobile Iraqi launchers in the gulf war?

General BUTLER. Only from the perspective that, because of its low observability, it may have increased endurance in a very threatening environment, which gives it more time to look.

But I would not pin great hopes on that.

Senator SPECTER. Thank you very much.

Thank you, Mr. Chairman.

Senator INOUYE. Senator Domenici.

Senator DOMENICI. Thank you, Mr. Chairman.

I, too, have to go to the Budget Committee and mark up a resolution, so I appreciate the opportunity to inquire.

And might I ask the chairman, is our next witness going to be Ambassador Cooper on SDI?

Senator INOUYE. Yes, sir.

Senator DOMENICI. I would ask if you might, Mr. Chairman or Senator Stevens, before you close that, my staff will be here, if you could have them run up and get me. I would like to inquire of the Ambassador for just a few moments.

Senator INOUYE. We will most certainly do that.

Senator DOMENICI. Gentlemen, let me take a couple of minutes to tell you what I see happening over the next 4 or 5 years regarding your current plans.

General BUTLER. Yes.

Senator DOMENICI. And then let me ask you about what you really have in your bomber arsenal under the rubric of the Strategic Air Command.

General BUTLER. Certainly.

DEFENSE BUDGET

Senator **DOMENICI**. First, General, let me tell you what I see. Contrary to the plans that you are following for the B–2 and another for another part of the Air Force building program, the new advanced tactical fighter that was awarded to the Lockheed team, I see the entire Defense Establishment following a 5-year series of budget lines that assume that we continue on a 5-year spending path as if Congress had agreed to certain spending levels in each year. We have agreed to the first 3 years but not the fourth and fifth years, and I do not believe that we are going to.

It is with reluctance that I tell you that. I think we should adopt spending levels for the fourth and fifth years right now, but we cannot. Now let me stop there for a minute. Do you understand what I am concerned about?

General **BUTLER**. I do.

Senator **DOMENICI**. OK. Now it seems to me that when we get commitments to very large weapon systems over a number of years, that those planning them ought to look at two other things besides what you are testifying to today, and that is, what happens if we have to cancel them midstream? And second, what happens if we cannot buy as many as you think? I ask this because I have already seen some very interesting Members of the Senate voting to reduce the defense numbers even now.

It seems to me that in the fourth and fifth years of the budget agreement, that we are going to be struggling up here with the questions of how much do we take out of defense for domestic programs.

And let me just suggest to you that right now the big weapon systems procurement that are being put into the budgets may not be adequately funded. In those fourth and fifth years, it may come as a shock to you and maybe even to the Chairman of the Joint Chiefs, but I think Congress is going to say, even 3.8 percent of our GNP for defense is too much, let us take another $10 billion to $15 billion out.

And I am worried about the weapon systems in place and the residual effect on the rest of the military. So might I ask just this general question, for a large system like B–2, do we know what it would cost to even cancel it midstream? What if we have it there and we say, no, we cannot finish it.

Now please do not misunderstand, that is not Senator Domenici's position at this point. I mean, I am for the B–2. I am going to ask you a few questions about whether you are exaggerating its capability, because even with lesser capabilities I would be for it.

So could you answer my question regarding whether we would be able to find out what might happen on these big systems if we canceled them midstream?

General **BUTLER**. I will. I am going to give you a couple of figures and simply ask for latitude to ensure the accuracy for the record. But we have spent about 50 percent of the anticipated program costs at this point, something over $30 billion. In terms of acquisition, we have less than 50 percent of the anticipated cost to go, about $28 billion in acquisition. If we terminated the program now, for example, we would be looking at termination costs that would drive total expenditures to about $36.5 billion. So there are billions of dollars involved in terminating and we would end up with 15 airplanes. Starting the clock right now for $28 billion, we get 60 more airplanes.

And notwithstanding the fact that we have spent an extraordinary amount of money and that $28 billion is still a lot of money to get 60 B–2's, with a caveat that they work, for that amount of money, it seems to me to be a very prudent thing to do, and that is to see this program through, particularly in light of the capabilities that I believe it will bring to national security.

Senator DOMENICI. General, I am fully aware of the fiscal benefits to maximizing the procurement of B–2's at this late date. They are dramatic. If you stop at 15, which some people in Congress are talking about, it is rather ridiculous. It would almost be better that we would not have done it. But it is done and most of the money is spent. The President has recommended 75 planes and you ought to do it. The incremental cost from 15 to 75 is just dramatic.

General BUTLER. It makes a huge difference to produce at an economical rate as opposed to stretching it out.

Senator DOMENICI. Those numbers are real, are they not?

General BUTLER. They are real numbers. As with any large weapons systems, unit costs are greatly dependent upon production rates.

Senator DOMENICI. If you feel you have answered this question either in your testimony or to another Senator inquiring, do not answer it because I do not want to waste time. But, General, assume we accept your notion of the B–2 with the foot-in-two-worlds concept as justification for the B–2. Could you respond to the suggestion that if you wanted a conventional bomber, you would not build the B–2, that you would have built something else? Would you answer that for us, please? I am just suggesting that some people say that and with this question assume I am.

TWIN TRIAD

General BUTLER. I would indeed. I understand the thrust of that question. I have been a strategist virtually my entire career. Before I came to this job, Senator, I was the Director of Strategic Plans and Policy for the Joint Staff. I worked directly for General Colin Powell. I played a major role in the development of the new military strategy and the base force that underpins it.

So one of the things that I would be most astonished over is if, as a strategist, as someone who has worked these problems for years, I did not do what was necessary to adopt strategy, doctrine, tactics, training, and the utilization of the most flexible platforms like the bomber to profoundly change international security situations.

Consequently, my ability to envision a twin triad concept that says bombers can swing from nuclear deterrence into conventional warfighting is predicated on the fact that there has been an extraordinary change in our relationship with the Soviet Union. Consequently, I can accept the fact that I do not have to have all my bombers sitting on 15 minute day-to-day alert, that I can, in fact, send 70 of them to the Persian Gulf to participate very effectively in conventional warfighting.

But if the President had decided at any moment we needed them back in the United States in a nuclear deterrence role, I could have had them all back and on nuclear alert within a number of hours.

So all I am saying is, thank God that 40 years of containment have brought us a circumstance in which I can utilize the inherent flexibility of my very best platform, which is the manned bomber. That is a payoff from winning the war of containment.

Senator DOMENICI. So you are saying, General, that what has happened is the Soviet Union's changes caused you to look at your strategic bombers with a different deterrent mission.

General BUTLER. On the one hand, the Soviet Union change, and the other, the fact that we had an extremely challenging war to fight in the Persian Gulf. As General Powell said, it took every tool in his bag to do it, to include the 7th Corps from Germany and a host of my strategic assets. That war could not have been fought, for example, without the tankers of Strategic Air Command. General Schwarzkopf could not have shaped the battlefield without the U–2's, TR–1's, and RC–135's describing it for him, and I think we played an invaluable role in decimating the Republican Guard and taking down Iraq's strategic infrastructure.

So when I look, Senator, at the prospect of a future Persian Gulf—and I am not saying that the war will happen there—I look and say, what will get me, as CINCSAC, an invitation to send forces to that war? If all I have are B–52's or 15-year-old B–1's that look like a large fighter on radar, I do not think I will get an invitation.

Consequently, we will lose the opportunity for the theater warfighter to have at his disposal the extraordinary capabilities that come with a large manned airplane like the B–2. That is a very simple calculation for me. It says where is the world going? What are we going to need to cope with it? When do we put those assets in place? And that is why I think it is so important to continue a program like the B–2 now.

Senator DOMENICI. So you would say that the change in the Soviet Union and her kind of threat truly permitted you to look at this bomber, at having a different mission along with its strategic capability. And you are telling us that it will do that job well?

General BUTLER. Indeed. In fact, we put 500,000 of our forces in the most intense conflict fought since the close of World War II 400 miles from the border of the Soviet Union and they not only did not object, they did not increase their levels of nuclear deterrence. They essentially accepted the political objectives of our presence there. I think that speaks to a rather enormous change in the attitudes of the Soviet Union and our relationship with them.

SDI/GPALS

Senator DOMENICI. My last question has to do with SDI. I assume you are familiar with the level of funding being requested for the strategic defense initiative, are you not?

General BUTLER. I am.

Senator DOMENICI. And you are familiar with the new thrust?

General BUTLER. GPALS.

Senator DOMENICI. GPALS. I am told that SDI will consume under the proposal $4.6 billion, or thereabouts, in the first year, going up to $5.5 or $6 billion and then leveling off. I am told that it would consume this year about 20 percent of the strategic nuclear of the strategic program's budget; is that correct?

General BUTLER. Sir, I would have to defer to the following witness on that. I am sure he can give you those figures with great accuracy. I cannot.

Senator DOMENICI. In any event I assume that you believe that that funding level is consistent with our country's current and future needs, all things considered, given your role as Commander of the Strategic Air Command.

General BUTLER. In light of fiscal constraints, in light of the current nature of our threats, particularly from the Soviet Union, but also with regard to GPALS from other nations who are developing a rather consequential ballistic missile capability, and the fact that we are on a measured, paced research and development program, I am comfortable with where we are.

Senator DOMENICI. One last question. General, I know you have thought about the fact that with the Soviet Union in a state of turmoil, and we do not exactly know where they are going to come out of this, clearly they are not moving ahead with great technological dispatch to new cutting-edge programs. They seem to be producing great quantities of what we have known about for a while, but they are not busy building a real competitor to the B–2 bomber or even a competitor to the new tactical fighter. What should push our cutting-edge technology if it is not an enemy? Just our ability? Should we just keep pushing it because we can?

General BUTLER. I would say above all things, Senator, it is the fact that for the United States, technology has historically done two things. One, it has allowed us to substitute high-technology weapons for manpower on the battlefield. In the Persian Gulf, that paid off in what will probably be 1,000-to-1 ratios in casualties as between the coalition and Iraqi forces. That is unheard of. That is unheard of in the history of warfare.

Second, it allows strategic planners like myself to be wrong.

Senator DOMENICI. To what?

General BUTLER. To be wrong.

Senator DOMENICI. Do you mean the margin of error is increased?

General BUTLER. Absolutely. And in the world that I see in a fuzzy crystal ball, and I will say that while I appreciate Senator Johnston's praise with respect to envisioning the outcome of the conflict once it had started, I wish I had been more sagacious 2 or 3 years ago in defining Iraq as an enemy with whom we would get embroiled in an extraordinary conflict in the Persian Gulf. I got an F on that score.

Senator DOMENICI. Thank you, Mr. Chairman.

Thank you, General.

Senator INOUYE. Thank you. Before I call upon Senator Cochran, I think it might be well to advise my colleagues that this weekend the F–117 will be at Andrews Air Force Base. If my recollection is correct, either June 11 or 12 the B–2, the new F–22, the ATF, plus the F–117A will be at Andrews. So it will be an extraordinary display of stealth. I hope that all of us can participate. Arrangements are now being made so that all of us can go there, because this will be a rare and unique opportunity, and I hope all of us will take advantage of that.

Senator Cochran.

NUCLEAR DETERRENCE

Senator COCHRAN. Thank you, Mr. Chairman.

General Butler, following up on a question that was asked by Senator Stevens in connection with the plans to stop producing Peacekeeper, what is the impact in your judgment, if any, on the ability of our industrial base to continue to maintain a state of viability and capability in case we do have to put back into production some missile lines? Is that going to jeopardize our ability for the future?

General BUTLER. It certainly gives one pause, Senator. In crafting the new national military strategy, I tried to look at it from the standpoint of those things that were absolutely essential to maintaining U.S. capability in the years ahead—trained manpower, for example, research and development in cutting-edge technologies, the support of friends and allies around the world—all the panoply of things that go into having a credible national security capability.

INTEGRATED WARFIGHTING

From my perspective, the long pole in the tent, the driver, the thing that will only determine the outcome is the health of our military industrial base. The ability to reconstitute a force in the event that that is required, to quickly array larger numbers of men and machines. So any time that we stop producing something that has been vital and will continue to be vital to our military capabilities, like nuclear deterrence, it gives one pause.

Given an ideal world, given a world that is not constrained by the kind of fiscal pressures that we are experiencing now, we would prefer to continue producing that missile. However, a very difficult, a very carefully gauged decision was made to stop that production, the principal impact being, for me, the diminution in the testing program, going from seven to three tests a year. I accept that decision, but I have reservations about it.

Senator COCHRAN. I know this is not a hearing where we need to get too deeply into the threat assessment, but it really does to me to seem to be a relevant consideration and without, you know, getting into highly classified information, I wonder if you have the concerns that I do that while we see changes in the Soviet Union—economically, politically, even deployment of conventional military forces in Eastern European countries and the like—there does not seem to be an corresponding builddown or change in Soviet nuclear strategy or modernization. Is that a correct assessment?

General BUTLER. It is from everything that we can see. There has to be some instructive lesson from the standpoint that, even as the Soviets retrench into their own borders, they watch the demise of the Warsaw Pact, the German reunification, they pull all of their troops out of Eastern Europe, and in the face of unmanageable economic chaos, where we see them continuing to make their principal investment is in the modernization of their strategic nuclear offensive forces.

I have inquired of our intelligence community from one end to the other why that is so, what surmise they make in that regard. I have gotten a variety of answers. One is, well, it is in their 5-year plan, and they do not know how to stop doing that. Things show up at the door, they get fabricated and SS–24's and 25's continue to plunk off the manufacturing line. I have heard it attributed to bureaucratic in-fighting in the Soviet Union; that bureaucracy is just able to out-muscle all the others, that is, some sort of mindless thing.

Third, and perhaps most compellingly from my standpoint, is that their strategic nuclear offensive arsenal is the one thing that continues to make the Soviets believe that they are a superpower, that that is what buys them a seat at the table amongst the giants of international affairs.

Finally, I would say, given their history, their paranoia, their concern about outside attack, they are just not comfortable until they feel like they have hedged themselves with an arsenal that we would find unbelievable and totally uncalled for.

So I do not know why they are doing it, Senator, but the fact is they continue to do so, and while they do, that is not an argument to match that force missile for missile—that is not my job. My job is to be able to execute the SIOP for nuclear deterrence. But I have to be mindful of it, because it goes to a mindset, and that mindset says to me they still place great value on strategic nuclear offensive systems. I wish they did not.

Senator COCHRAN. Given that assessment, I think it is probably wrong to set out as a reason for developing a new global strategic plan for the United States, for us to assume that the Soviets are retrenching, as you say on page 3 of your statement, the first in a list of changes on which we are now basing a new global strategy. You say, "Soviet retrenchment in the end of the cold war, events so consequential they are akin to a virtual second Russian Revolution."

I just think that is basically inaccurate as far as strategic threat is concerned, nuclear threat, and therefore, our strategic strategy. So I am hoping that we—throughout the rest of the statement, though, I do not find any fault with the new military strategy because you go on to point out that the No. 1 challenge that we face is nuclear deterrence in our relationship with the Soviet Union.

And so I understand that that has not been forgotten. But what I worry about in hearing all the conversation today is we are exploring all the new conventional opportunities for involvement and being invited to participate in future skirmishes and wars because of these other flexible capabilities of the Strategic Air Command.

I just hope we do not get carried away and forget the basic role and responsibility which, to me, is the nuclear deterrence and dealing with the awesome threat of nuclear weapons and what they pose in terms of U.S. security for the present and, obviously, for the near-term future. We do not see any signs of that changing. I do not know, I would not put that No. 1.

I think we can be hopeful that the Soviets will retrench, but it will certainly make me feel a lot more comfortable if they would aim those missiles in another direction. They are all targeted to U.S. targets, are they not, basically?

General **Butler**. We have to surmise.

Senator **Cochran**. I presume they are.

General **Butler**. We have to surmise that they are.

Senator **Cochran**. And that has not changed.

General **Butler**. No. When I use the word retrenchment, Senator, when I talk about a virtual second Russian Revolution, I do that from two perspectives. No. 1, is the fact that they have accepted the end of the Warsaw Pact and that they are pulling 500,000 troops and more back into the Soviet Union. To me, that is retrenchment in a very real world, factual sort of way.

With regard to retrenchment from hegemonic, aggressive, Stalinist-era global aims, that is problematic. But from everything we see on the surface, they have abandoned that if only because of economic penury. I cannot speak to what goes on in their heart of hearts.

But from the standpoint of having to make near-term judgments about what is the minimum force that we should sustain with regard to the Soviet Union and their enduring capabilities, when I look at the world threat I always break it down into two components. One is sheer military capabilities and the other one is intentions. Intentions are, indeed, fleeting. They can change overnight and the capabilities remain.

But at the same time, I believe that what we have seen transpire in the Soviet Union under 6 years of Gorbachev's leadership really does represent some sort of extraordinary departure from the sharply hostile, ideological days of the depths of the cold war. That is not to say that they have become our friends. That is not to say that we will join hands and march off into some new benign world order.

As I say in my statement, I have a foot in two worlds. Of all of the Commanders in Chief, I have to keep an eye on my 6:00. I have to keep a wary eye on what is happening in the Soviet Union. But at the same time, if it is a characteristic of this new world order that it is unpredictable, that spontaneous and sharp threats to U.S. vital interests can arise around the globe, then I believe I have an extraordinarily important role to play in that from the inherent capabilities of my systems.

So I look then at this twin challenge and that is where this phrase that I have coined about the twin triad comes from. I feel like I need to play a role in two worlds. If my resources are shrinking, I have got to get more out of them. The way I do that is by turning to the manned bomber and returning to its multirole inherent capabilities for both nuclear deterrence and conventional warfighting.

But I do not disparage the threat, Senator. I would not want you to overread those opening words. I just do not want to give the impression that I am an unreconstructed cold warrior.

Senator **Cochran**. I do not want to think of myself in that way, either. But I really think that we make a mistake if we start assuming that the Soviets have abandoned their nuclear arsenal in terms of the use of it and the potential effect in trying to enforce their will.

General BUTLER. It remains a frightening reality.

Senator COCHRAN. It just worries me. And in the conduct of this Persian Gulf war situation, you could think about the possible uses if they decided that there were too many U.S. forces in the region.

If we were assuming too large a share of the responsibility for shaping the future of that region, we could have seen a Cuban missile crisis in reverse with their calling us and saying we think you should remove about one-half of your troops and about one-half of those naval forces and we expect to see some action in that regard within the next 48 hours and unless you do, you are under a threat from our nuclear capability.

General BUTLER. Those prospects are still there.

Senator COCHRAN. That is a pretty cute little gut check. And with the weapons systems to back up that kind of threat, I think we need to be darn sure that we are not stopping the production line of deterrent forces and systems and that we are not failing to continue to modernize just as they are in this nuclear area. I hope that the Strategic Air Command is at the cutting edge of that effort.

General BUTLER. That is still my charge, sir.

Senator INOUYE. Thank you.

I have been on this committee for over 2 decades now. I must say that this testimony has been the most cogent, concise, and understandable that I have heard on the mission of SAC. As a result, I have a great regret that my colleagues are not all assembled here to have had the opportunity of hearing you.

Reading your testimony and listening to you, it would appear to be only logical and rationale to adopt the twin triad. I cannot see how we can oppose that.

Having said that, I would hope that as CINC you would keep in mind the concern expressed by Senator Cochran because there are some, and I believe there are many, who are beginning to feel that maybe the pendulum is swinging too far the other way. At one time the top priority of your command was nuclear. Now the enthusiasm and exuberance is for conventional.

We are just wondering how far it will move. I just hope that as you move along in your twin triad concept, you will keep in the mind the valid concern expressed by Senator Cochran.

CLOSER INTEGRATION WITH TACTICAL AIR COMMAND

Having said that, I have a question. It is obvious that with the adoption of the twin triad concept, you will have to get closer integration on communication, training, and intelligence with the tactical forces, the Tactical Air Command. I would presume that this will cost money. Do you have any idea what it will cost?

General BUTLER. In fact, Senator, I intend that it save money. Let me give you a small anecdote. When I went to the change of command at Langley Air Force Base, when my dear friend and former roommate from the Vietnam era, Gen. Bob Russ, retired and was replaced by my colleague from the Air Force Academy, Gen. Mike Loh, I told General Loh, in the receiving line, congratulations on the two events that had just transpired.

He said, "What do you mean?"

I said, "Well, of course, your change of command, and the second is your engagement to Strategic Air Command."

Because, for conventional warfighting, there is nothing to choose between us. We are both force providers to theatre warfighters. He provides an array of assets to put at the disposal of that commander to engage in an integrated targeting campaign, just as I did. And so, A–10's and F–16's and F–15E and Toronados, and B–52's were all targeted by the same cell in the same daily FRAG order, and we all were put day to day against those targets that made most sense for the capabilities we brought to that day's objectives.

So as I integrate my strategic forces into so-called tactical forces, Senator, one of the things that General Loh and I have already made a commitment to do is to integrate all of our conventional munitions programs. We will find savings by doing that as partners as opposed to doing it in isolation. We will become much better able to fight in common because we will share common tactical nets.

We have put capabilities in our conventional bombers, Senator, which marry immediately with tactical nets. That is not the problem. It is not a matter of inventing new hardware. It is a matter of getting our doctrine and our tactics straight. And that is where we are going to put our efforts. We have made that commitment to each other.

Senator INOUYE. How long will it take for the two commanders to come up with this tactical plan?

General BUTLER. We have already begun that process and over the course of the next several months, because we had the experience of the gulf behind us, which is to say operating our assets together, we are well along the way. The Chief of Staff, Senator, General McPeak, had begun an initiative, of which you may be aware, called the composite wing at Mountain Home Air Force Base in Idaho.

We are in the process of putting together what we call a composite wing of so-called strategic and tactical assets in order to gain the experience of building a package of capabilities without regard to whether or not they are called strategic or tactical, in which we will train together, exercise together, and, if necessary, pick up and go fight together. That is a new way of doing business for the U.S. Air Force. I think it is exactly the right way to go and I am supporting it 100 percent.

Senator INOUYE. Is this a pilot program?

General BUTLER. It is indeed.

Senator INOUYE. I suppose it will work, and with your exuberance, it will become a reality, will it not?

General BUTLER. It will become a reality. I am committed to it. Not only should it work, it must work. Integrated warfighting is the name of the game, and not just among Air Force assets. We are talking about Army, Navy, Air Force, and Marine assets, as we did in the Persian Gulf.

PHILIPPINE NEGOTIATIONS

Senator INOUYE. I believe that it would be appropriate to note at this moment that the negotiations in the Philippines is not going along well. If it does not improve, there is a likelihood that we may have to begin withdrawing forces and aircraft and such from the Philippines in September.

General BUTLER. That is correct.

Senator INOUYE. Just a few months away. That being the case, would it have any immediate or important impact upon your operations?

General BUTLER. Not immediate from the standpoint of being able to mount a strategic campaign because Guam is still available to us. We still have access to support bases in the Indian Ocean, and interestingly, for an airplane like the B–2, if I were operating only from Whiteman Air Force Base, its initial base, Guam, and the Indian Ocean, I can range the entire world with a single refueling with a bomber-type platform and I can do it with impunity.

So, while the Philippines is not of direct concern to me as a strategic warfighter, it is of considerable concern with regard to the fact that I cannot do any air campaign alone. And I hope that none of my remarks insinuated that. But what I can be is the leading edge of a campaign when the President wants to reach out and touch someone right now in order to send an important message, stop what you are doing, I will not let the aggression stand.

But from the standpoint of mounting the kind of concerted, joint, far-reaching campaign that is required to put down a crisis at distant shores, the bases of the type that we have in the Philippines have been very important to us. If we lose those bases, then once again, that key word, flexibility, will have been diminished. I know you have been there, Senator, and you have had those discussions. I hope to God that the people there understand what they stand to lose and what we stand to lose if those negotiations break down.

Senator INOUYE. Thank you very much. Senator Johnston.

Senator JOHNSTON. I have no further questions, Mr. Chairman.

Senator INOUYE. Senator Stevens.

Senator STEVENS. Well, General, I join the Chairman in thanking you for a most interesting presentation. And we are happy you are where you are.

General BUTLER. Thank you.

Senator STEVENS. And I am hopeful that we will arrange to bring the committee out to visit you soon. The concept of these composite wings is a very interesting one. It is not new. It is a concept that is welcome back, though. Thank you very much.

Senator INOUYE. Senator Cochran.

Senator COCHRAN. I have no further questions, Mr. Chairman. Thank you.

Senator INOUYE. Well, once again, I thank you very much, General Butler. It has been an important morning. I will advise and strongly recommend to my colleagues that they read this record, the testimony, because we will be called upon in a few weeks to make decisions that will have a major impact upon the future of the United States. Accordingly, I hope that we can call you back again, if necessary, for classified meetings, and such.

General BUTLER. I am at your disposal, Senator.

Senator INOUYE. Thank you very much, General Butler.

STRATEGIC DEFENSE INITIATIVE ORGANIZATION

STATEMENT OF HON. HENRY F. COOPER, DIRECTOR

INTRODUCTORY REMARKS OF SENATOR INOUYE

Senator Inouye. Now Ambassador Cooper will discuss the current status of SDI.

We are most privileged to have with us the Director of the Strategic Defense Initiative Organization, Ambassador Henry F. Cooper.

This is your first meeting with the subcommittee, and we welcome you, sir. We look forward to your testimony. You may proceed.

Ambassador Cooper. Thank you, Senator.

We submitted to you a rather extensive statement, and I would request that it be included in the record.

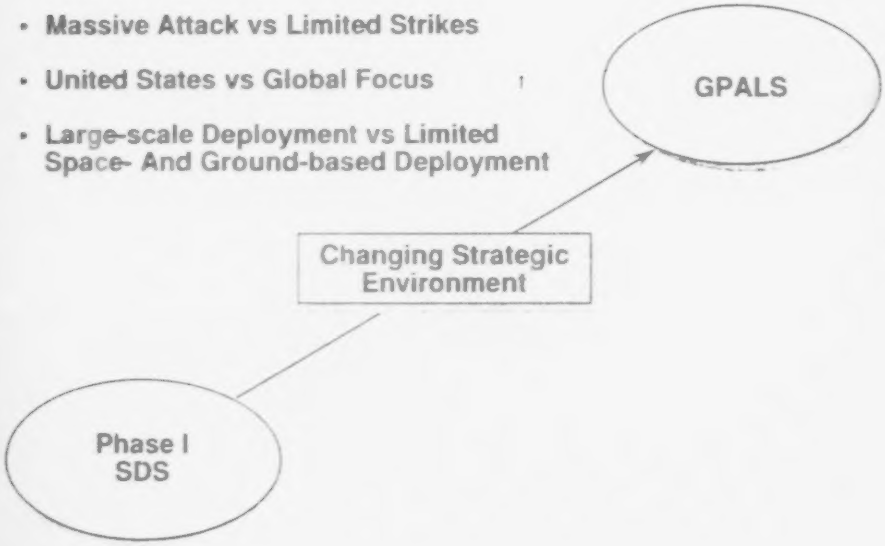
Senator Inouye. That statement has been made part of the record, sir.

SUMMARY STATEMENT OF AMBASSADOR COOPER

Ambassador Cooper. I would like to make a few brief comments, if I may, to introduce the discussion. I want to thank you and the other members of the committee. It is an honor to be with you to share the scope and the direction that President Bush and Secretary Cheney has set for SDI.

WHAT DOES "REFOCUS" MEAN ?

- Deterrence vs Protection
- Massive Attack vs Limited Strikes
- United States vs Global Focus
- Large-scale Deployment vs Limited Space- And Ground-based Deployment



GPALS

Changing Strategic Environment

Phase I SDS

GLOBAL PROTECTION AGAINST LIMITED STRIKES

In response to over 2 years of review of the emerging, post-cold war world, and the President's direction, we are focusing our efforts to develop a system to provide for global protection against limited strikes, or GPALS as you may have heard.

Global means worldwide, continuous coverage. Protection means that we intend to destroy all the attacking reentry vehicles of a limited attack and limited means up to about 200 reentry vehicles.

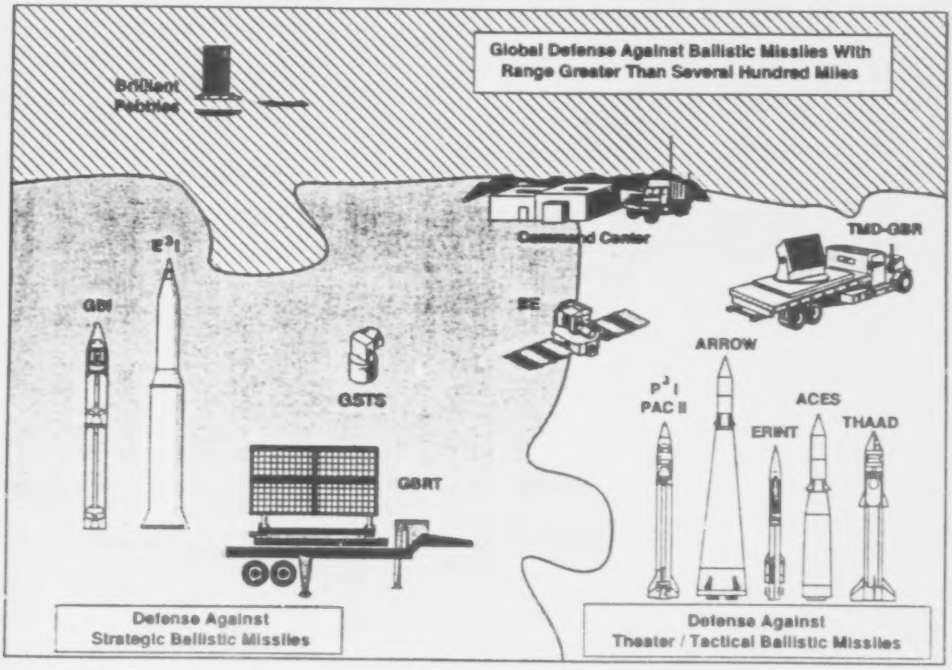
GPALS marks a break with the previous SDI concept, that a phase I defense against a massive Soviet attack was the smallest deployment of significant strategic value. In this previous concept, protection against limited strikes would have been a byproduct of deploying ever more capable defenses to counter the offensive developments of a noncooperative Soviet Union with a robust economy.

Now GPALS will constitute the initial deployment and decisions on deployments beyond GPALS will depend on future circumstances.

In particular, in adopting GPALS we have relaxed our objective of reaching an early concept definition validation decision for a follow-on directed energy defense system concept. At the same time, we intend to maintain a vigorous technology demonstration program in this area.

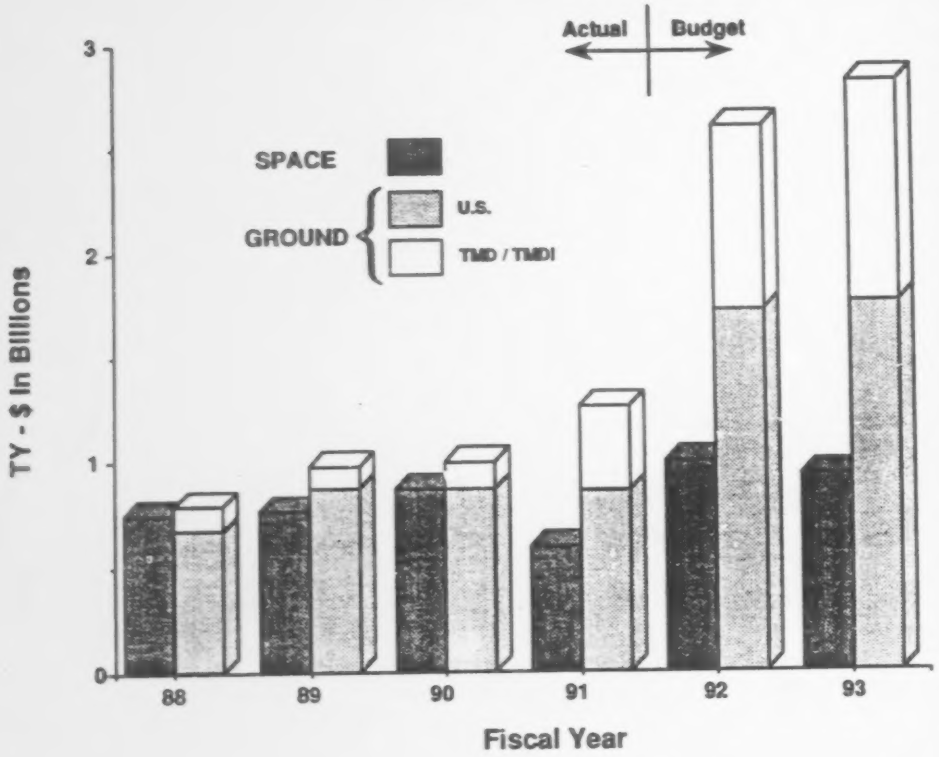
At smaller and less costly deployment levels, GPALS will directly address the security issues that exist today and are likely to become more acute in the future for ourselves, our allies, and friends. Furthermore, it will do without threatening the Soviet's strategic retaliatory capability or first-strike stability considerations vis-a-vis the Soviet Union.

GLOBAL PROTECTION AGAINST LIMITED STRIKES (GPALS)


Brilliant Pebbles
Global Defense Against Ballistic Missiles With Range Greater Than Several Hundred Miles
Command Center
TMD-GBR
E³I
GBI
BE
GSTS
GBRT
ARROW
P³I PAC II
ACES
ERINT
THAAD
Defense Against Strategic Ballistic Missiles
Defense Against Theater / Tactical Ballistic Missiles

GPALS, as illustrated on the chart to your left, consists of three complementary system elements that will operate under the overall supervision of an internetted, distributed, survivable command and control system. The size of the individual puzzle pieces reflect the relative cost of the three GPALS elements.

SPACE - GROUND R&D INVESTMENTS



Out of every $4, $1 will go toward theater defenses, $2 toward U.S. ground-based defenses against strategic ballistic missiles, and $1 toward Brilliant Pebbles, the space-based defense.

The first GPALS system element, stand-alone defenses against theater/tactical ballistic missiles, reflected by the green puzzle piece on the lower right-hand side, could be deployed indigenously within the theater, be transported on-board ships at sea, or be available for rapid transport to regional hot spots. It would involve both space- and mobile ground-based sensors.

The second GPALS system element is a ground-based defense system to counter strategic ballistic missiles. It would embody about six U.S. deployment areas and involve space and mobile ground-based sensors and about 750 ground-based interceptors, about one-half the number required to meet the phase I objectives.

The third GPALS system element, the space-based tier, consists of about 1,000 Brilliant Pebbles, less than one-quarter of the constellation required to meet the phase I objectives. As a stand-alone, autonomous system, Brilliant Pebbles could counter strategic or theater ballistic missiles, provided their range exceeds about 300 to 600 miles.

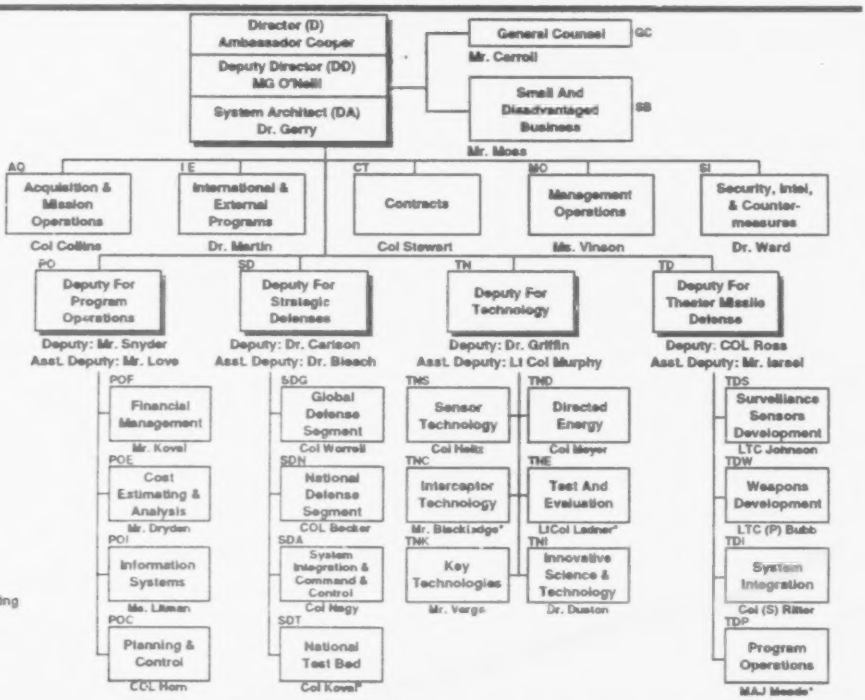
Our acquisition strategy is to develop the technology as it matures and as it is proven to deploy defenses in an evolutionary approach. In keeping with congressional priorities, the first increment will be near-term upgrades to the Patriot system, and by the mid–1990's, wide area stand-alone theater defenses.

These improved theater missile defenses will correspond to our growing concern about the proliferation of theater ballistic missiles of increasing range, lethality, and sophistication.

As demonstrated by Desert Storm, space-based sensors will play an important role in improving the effectiveness of all ground-based defenses including theater defenses.

Later in this decade we seek to deploy U.S. ground-based defense against long-range strategic missiles. Such defenses include Brilliant Eyes, a space-based sensor system to provide critical tracking and discrimination information. We also seek to deploy the autonomous Brilliant Pebbles system concurrently with the U.S. ground-based defensive system to provide continuous global protection for the United States, our forward-deployed and power projection forces, and our friends and allies.

STRATEGIC DEFENSE INITIATIVE ORGANIZATION



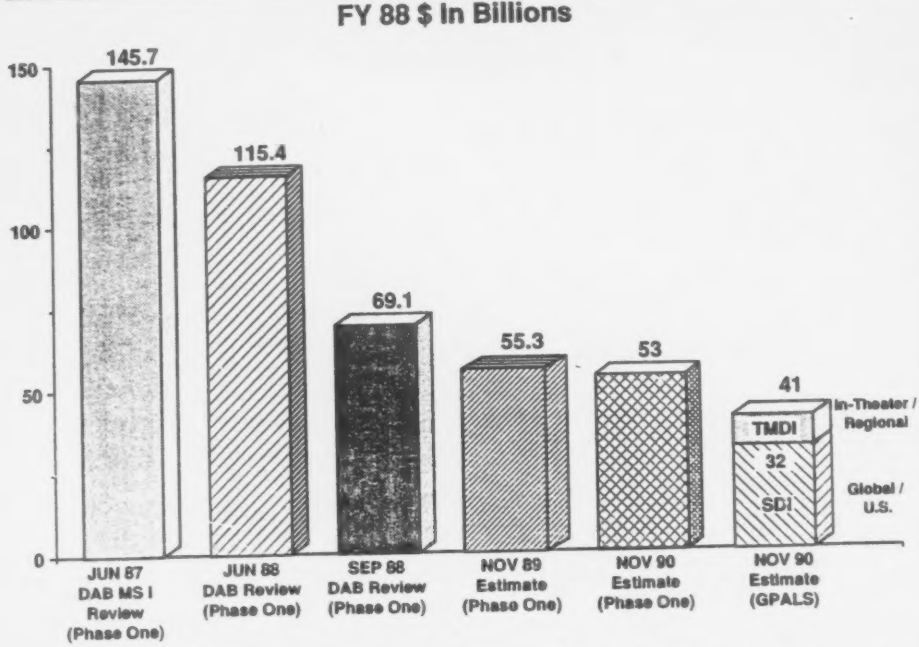
Director (D)
Ambassador Cooper
Deputy Director (DD)
MG O'Neill
System Architect (DA)
Dr. Gerry
General Counsel
GC
Mr. Carroll
Small And Disadvantaged Business
SB
Mr. Moss
AO
Acquisition & Mission Operations
Col Collins
IE
International & External Programs
Dr. Martin
CT
Contracts
Col Stewart
MO
Management Operations
Ms. Vinson
SI
Security, Intel, & Counter-measures
Dr. Ward
PO
Deputy For Program Operations
Deputy: Mr. Snyder
Asst. Deputy: Mr. Love
SD
Deputy For Strategic Defenses
Deputy: Dr. Carlson
Asst. Deputy: Dr. Bleach
TN
Deputy For Technology
Deputy: Dr. Griffin
Asst. Deputy: Lt Col Murphy
TD
Deputy For Theater Missile Defense
Deputy: COL Ross
Asst. Deputy: Mr. Israel
POF
Financial Management
Mr. Koval
POE
Cost Estimating & Analysis
Mr. Dryden
POI
Information Systems
Ms. Litman
POC
Planning & Control
COL Horn
SDG
Global Defense Segment
Col Worrell
SDN
National Defense Segment
COL Becker
SDA
System Integration & Command & Control
Col Nagy
SDT
National Test Bed
Col Koval*
TNS
Sensor Technology
Col Heitz
TNC
Interceptor Technology
Mr. Blackledge*
TNK
Key Technologies
Mr. Verga
TND
Directed Energy
Col Meyer
TNE
Test And Evaluation
LtCol Ladner*
TNI
Innovative Science & Technology
Dr. Duston
TDS
Surveillance Sensors Development
LTC Johnson
TDW
Weapons Development
LTC (P) Bubb
TDI
System Integration
Col (S) Ritter
TDP
Program Operations
MAJ Meade*

* Acting

In response to the Secretary's direction and the new priority assigned to theater missile defenses, we have reorganized within SDIO to elevate the management of these more robust theater missile defense systems to the deputy level, a general officer equivalent position.

The reorganization also creates, at the same organizational level, a deputy for strategic defense, who will be responsible for the overall integration of the GPAL's system and all program elements associated with both U.S. ground-based systems to defend against strategic ballistic missiles and the space-based global defense. That is the Brilliant Pebbles program.

SYSTEM ACQUISITION COST EVOLUTION



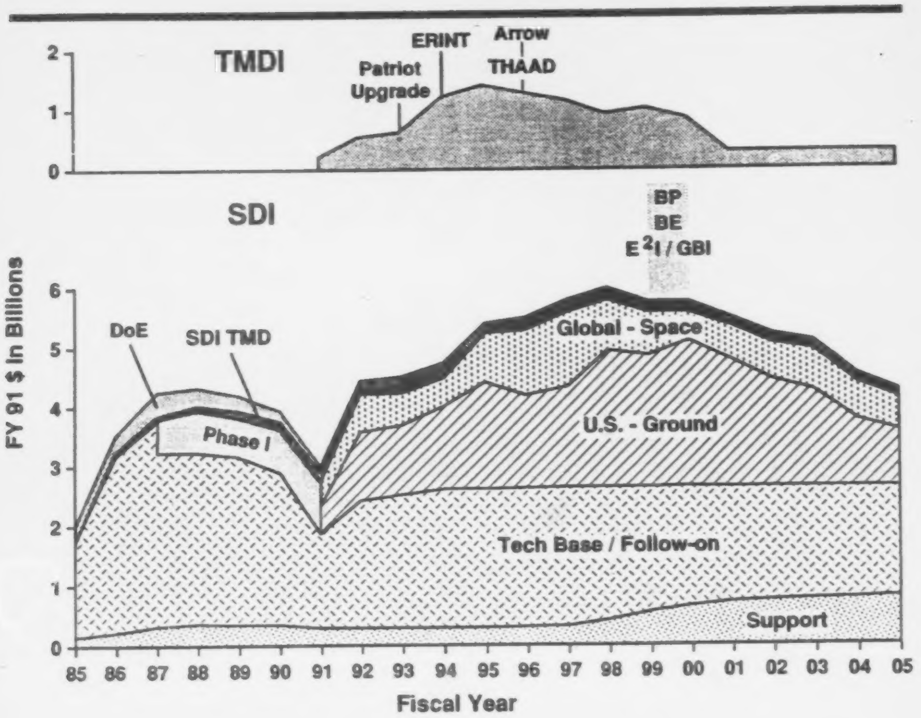
Now I would like to call your attention to the chart on your right-hand side, which summarizes the investment strategy for both theater missile defense, that is the TMDI at the top and the SDI programs at the bottom.

As indicated by the upper TMDI budget profile, initial deployments in the early 1990's would involve block changes to Patriot, which could include the addition of extended-range interceptors such as ERINT, a limited area hit-to-kill interceptor that, if successfully demonstrated, will quadruple the fire power of Patriot.

We intend to work with the Israelis to allow them to deploy Arrow by the mid–1990's. We are also challenging U.S. industry to bring in the theater high-altitude area defense system of THAAD as it is called, within the same timeframe as Arrow. Arrow and/or THAAD will increase by a factor of 10 to 100 the area that can be protected by a Patriot battery today.

The SDI budget profile in the lower portion of this chart will provide defenses for the American people in the late 1990's. These defenses would include ground- and space-based sensors and interceptors.

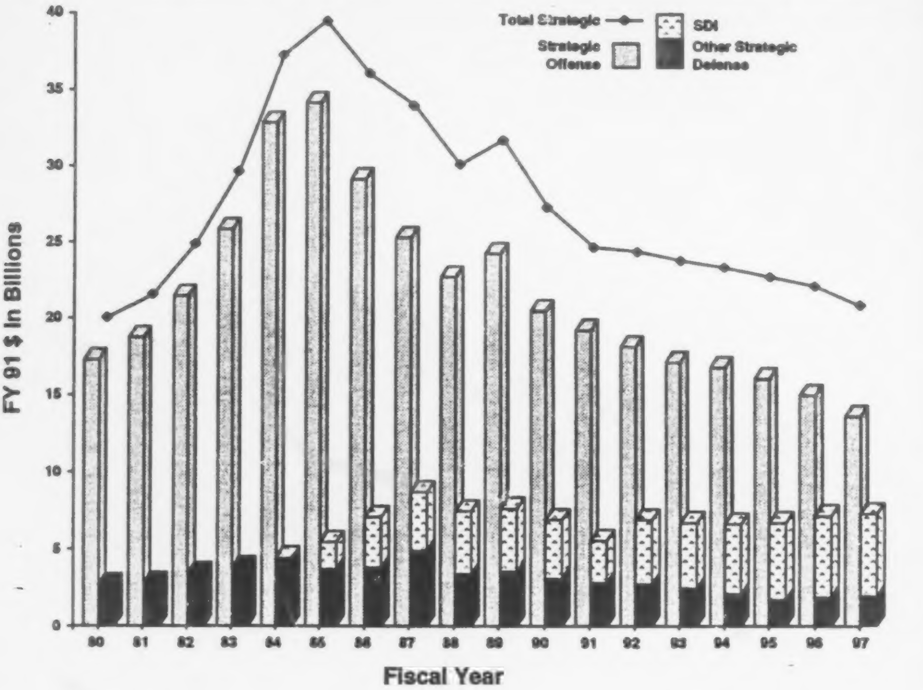
BMD BUDGET EVOLUTION



In last year's congressional debates regarding the affordability of the SDI program, many rightly questioned the realism of over $12 billion annual budget requests in the mid to late 1990's.

Now, as illustrated here, we have established a limit at $6 billion in fiscal year 1998 for the historic SDI programs. This is a dollar limited, not a technology limited program. The Brilliant Pebbles and U.S. ground-based defense programs have been balanced to lead to concurrent deployment possibilities in the late 1990's, and that is illustrated by the vertical shaded line over in the 1998 and 1999 time period.

STRATEGIC BUDGET



Now I would like to call your attention to the chart on your left, which summarizes the DOD funding for strategic programs over the future years defense plan [FYDP]. You will note the significant reduction in the DOD budget investment in strategic systems which reflects the results of the budget summit last year.

The $6 billion ceiling for strategic defense is about 20 percent of the amount spent this year on all strategic programs and about 2 percent of today's overall defense budget.

Returning to the chart on your right, the President's fiscal year 1992 request would restore SDI to approximately its fiscal year 1988 funding level in constant dollars counting the DOE funding. Such a level is necessary if we are to develop and deploy defenses for the American people by the end of this decade.

I would observe that last year's severe cut, that is the notch in this chart for the technical base and follow-on activities, reduced the funding to a lower level than in fiscal year 1985, the first year funds were appropriated for a separate SDI program.

This was a very painful cut to important work that we believe can pay great dividends, not only for SDI, but also for our entire defense and commercial sector.

Counting theater missile defense programs, we intend to invest on an annual basis fully three times as much in ground-based defensive systems as in Brilliant Pebbles, the space-based layer. This annualized budget strategy is consistent with our estimates for the three elements of the GPALS system, illustrated to your left, which is estimated to cost a total of $41 billion in 1988 dollars.

Of this, about $9 billion is associated with theater defenses; $10 billion is for Brilliant Pebbles; and $22 billion is for the U.S. ground-based defensive system. If you want to put that in 1991 dollars, the numbers convert to about $10 billion, $11 billion, and $25 billion respectively, for a total of $46 billion.

Given this overall investment strategy, let me give some general observations about how we distributed the 35-percent reduction in the President's fiscal year 1991 budget request last year; that is, from $4.46 billion down to $2.8 billion.

This was a real cut from the fiscal year 1990 funds, managed by SDI, of over $600 million, leading to termination costs of over $32 million and severe curtailment of work on promising technologies and at least a 2-year delay in the development activities that could lead to the deployment of defenses for the American people, now delayed until the late 1990's.

We reduced by 36 percent the total R&D supporting the space-based tier of GPALS, which would, on a continuous basis, defend against ballistic missiles launched from anywhere in the world to anywhere else in the world, provided the range was more than about a few hundred miles.

This means that we are investing 32 percent less than last year on the space-based tier of the strategic defense system. At the same time, we reduced our investment in the R&D for the ground-based defense systems against strategic ballistic missiles by 22 percent from the President's budget, and by retaining essentially the same level of funding as we had in fiscal year 1990 in this year, the ground-based U.S. defensive system is assured a deployment option for the timeframe as Brilliant Pebbles—that is, near the end of the 1990's.

BALANCE BETWEEN NEAR- AND FAR-TERM TECHNOLOGIES

I would like to turn briefly to the issue of balance between near- and far-term technologies. The severe 1991 congressional cuts, which reduced the President's budget by 35 percent, were allocated as follows: there was 33 percent absorbed by the GPALS elements as demonstration and validation programs were stretched by at least 2 years; 36 percent was absorbed by directed energy programs, requiring delays and/or cancellation of several promising technology demonstration programs; and 31 percent was absorbed by the basic phenomenology and technology programs, resulting in substantial curtailment in investigations of survivability, lethality, discrimination, simulation, new materials, cryogenic coolers, onboard high-speed signal and sensor data processes, and the innovative science and technology area.

A word or two about the arms control considerations. Mr. Chairman, I wish to emphasize that we are conducting the program within the constraints of the ABM Treaty. In addition, as a matter of U.S. domestic law, we are conducting our experimental work according to congressional directions, whose effect is that we not initiate funding of long-lead items unique to any experiment that, when conducted, might exceed the limits of the so-called narrow interpretation of the treaty.

This latter constraint restricts sound engineering practice and results in experimental programs that take longer and produce greater acquisition, schedule, and cost risks than would be the case if we were free to pursue more direct, full-scale testing during the current demonstration and validation phase.

Even so, if we progress at the planned pace, we will have to begin in the next 2 years to 3 years funding long-lead items for full-scale development testing scheduled to begin in the mid–1990's. We will need to work with the Congress for relief from the long-lead language, which is more constraining than the ABM Treaty, itself.

Furthermore, I believe we must be absolutely clear about the fact that the deployment of any meaningful defense against strategic ballistic missiles, whether space-or ground-based, will require relaxation of the ABM Treaty constraints. For example, approximately six ground-based sights are needed to provide coverage of the entire United States, including Hawaii and Alaska. So to provide even this protection of all Americans against limited attacks, we must go beyond the one sight permitted by the 1972 ABM Treaty as amended in 1974. And, of course, space-based sensors and interceptors are both key to accomplish the GPALS mission.

I would like, Mr. Chairman, to associate myself closely with the recent conclusions by former Secretary of State, Henry Kissinger, who was a principal architect of SALT I and the 1972 ABM Treaty. In his April 2, 1991, Washington Post survey of the broader strategic consequences of the gulf war, he observed that, "Limitations on strategic defenses will have to be reconsidered in the light of the gulf war experience. No responsible leader can henceforth leave his civilian population vulnerable."

Here, it should be understood that the ABM Treaty itself explicitly acknowledged in 1972 that the strategic situation could change and provided a means for its own amendment. It is precisely the recently changed and currently changing strategic situation that has lead President Bush to direct us to refocus the SDI program on GPALS.

I am persuaded that if we can achieve bipartisan support for our program in the Congress that the Soviets will negotiate seriously to relax the ABM Treaty regime and to permit deployment of GPALS while continuing a meaningful arms control regime.

STATEMENT BY THE PRESIDENT

"The Primary Limit To Our Ability To Develop The Technology Necessary For Ballistic Missile Defense Is Our Commitment To Do So. The Pace Of Our Reseach Has Been Limited Not By Technological Difficulties, But By Congress' Unwillingness To Fund SDI Adequately. I Have Listened To The Concerns Of Congressional Leaders And Taken Into Account The Changing Strategic Environment. As A Result, I Have Re-focused SDI's Priorities To Provide Protection Against Limited Ballistic Missile Strikes. Now It Is Up To Congress To Respond By Supporting My Request For SDI Funding."

President George Bush
The White House
22 MAR 91

In concluding, Mr. Chairman, I would like to quote President Bush. On March 22, 1991, he emphasized, "The primary limit to our ability to develop the technology necessary for ballistic missile defense is our commitment to do so. The pace of our research has been limited not by the technological difficulties, but by Congress' unwillingness to fund SDI adequately."

And he said, "I have listened to the concerns of the congressional leaders and taken into account the changing strategic environment, and as a result, I have refocused SDI's priorities to provide protection against limited ballistic missile strikes. Now it is up to the Congress to respond by supporting my request for funding."

In echoing his statement, Mr. Chairman, I wish to emphasize that this is an absolutely critical year for us. Last year's cuts severely wounded the program in my judgement, reducing it to a subcritical status—probably to less than what would have been spent on the key SDI technologies had there never been an SDI program.

Our objectives respond to an apparent need and are technically achievable in this decade. Our acquisition strategy is affordable and coordinated within an overall declining strategic forces budget, as I indicated here. Overall, I believe our new approach provides a basis for common ground regarding SDI with the Congress, with our allies and friends, and with the Soviets.

But, Mr. Chairman, everything depends upon our ability to build a bipartisan base of support in the Congress. And I would like to work closely with the members of this committee to develop the necessary bipartisan support to restore SDI to a healthy program, and by the end of this century, to provide viable defenses to protect the American people, our forces overseas, our friends, and allies against limited missile attacks, regardless of their source.

Thank you, Mr. Chairman.

[The statement follows:]

STATEMENT OF AMBASSADOR HENRY F. COOPER

Thank you Mr. Chairman and members of the Committee. It is indeed an honor to share with you the scope and direction that President Bush and Secretary Cheney have set for the Strategic Defense Initiative (SDI) program.

Mr. Chairman, I request that my testimony be supplemented with the SDI Summary Program Description which accompanied the President's FY92–93 budget request to the Congress and the DOD Theater Missile Defense (TMD) Report to Congress. I would also refer the Committee to the 1991 Report to Congress on the SDI Program, which will be submitted to the Congress very shortly, and which provides an in-depth discussion of the defense policy basis, acquisition strategy and associated funding requirements, and status of our overall program.

It was my honor to represent the United States at the Defense and Space Talks with the Soviet Union for five years. As a diplomat, I pressed U.S. objectives of moving toward a new strategic regime in which non-nuclear defenses are developed, tested, and deployed to improve the safety and security of people everywhere. I agree with those continuing arms control objectives. As an engineer, I agree with the President's suggestion over two years ago, that the technology is ready to come out of the laboratory, to be tested, proven, and deployed. I strongly believe that effective defenses will become increasingly important in strengthening stability in the emerging multipolar world, and that they can be deployed in conjunction with a meaningful arms control regime.

CHANGING STRATEGIC CONTEXT

Many in the press have characterized 1991 as the year SDI was "reborn." In two ways they are correct. First, President Bush gave us a new focus with the principal objective of providing global protection against limited strikes (GPALS). Second, the strategic impact of the Patriot missile defense during Operation Desert Storm has inspired many critical observers to reexamine old assumptions and to look at ballistic missile defenses in a new light.

However, the decision to refocus the SDI program was not an opportunistic response to the Gulf War, as suggested by many traditional opponents of SDI. Indeed, President Bush made his decision to refocus the SDI program based on the results of almost two years of intensive review of the changing international security environment. It was my privilege to participate in that review, initially from the vantage point of a Chief U.S. Negotiator with the Soviet Union and subsequently,when I returned to the private sector, in conducting an independent review of the SDI program for Secretary Cheney. My report of March 15, 1990 recommended renovating the overall strategic defense system architecture, and urged that the Department evaluate defensive options to provide protection against limited strikes.

Thus, the recent events in the Gulf War have, in my view, validated the conclusion and recommendations of the prior two years of review regarding SDI's role in the rapidly evolving world. In particular, President Bush's judgment, offered two years ago, that strategic defense makes more sense now than ever before seems to be clearly true.

Primary considerations in charting a new course for SDI are the new realities of a multipolar world now emerging from the bipolar U.S.-Soviet, East-West, paradigm that has dominated international military-political affairs for the past 45 years. Particularly important are the political instabilities within the Soviet Union and the proliferation of high technology throughout the world, providing numerous nations the future capability to threaten even distant capitals with attack by ballistic missiles armed with weapons of mass destruction.

With respect to the Soviet Union, the review indicated that while many things clearly have changed, other things have not. Recent dramatic changes in the East-West relationship have reduced the risk of conventional and nuclear war with the Soviet Union. However, optimism regarding the irreversibility of this improvement must be tempered because the Soviet Union is, and for the foreseeable future will remain, the only power on earth capable of destroying the United States.

In this context, we cannot ignore the political instabilities in the Soviet Union and the possibility that internal unrest could increase the potential for accidental or unauthorized use of ballistic missiles. While not suggesting that something on that order will happen, I would caution against dismissing concerns that even the Soviet leadership has on occasion expressed.

Surely, if defending against accidental and unauthorized launches was a valid concern in 1988 when Senator Nunn argued that should be the focus of SDI, it is a greater concern today.

The President's review also pointed to the growing threat posed to the United States and our deployed troops, our friends and Allies by proliferation of ballistic missiles and weapons of mass destruction. Consider the following statistics:

—Today some 14 Third World countries have ballistic missiles; within 10 years, that number could grow to 24 or more.

—Most Third World missiles now have ranges less than 1,000 kilometers (km), or 600 miles. By the year 2000, six or more states probably will have ballistic missiles with medium to intermediate ranges, i.e. 3,000 to 5,500 km (1,800 to 3,300 miles). Some could have missiles able to reach the continental United States.

—Most of these countries with ballistic missile programs also have chemical weapon programs. Four states with ballistic missile capabilities currently either have or are working on nuclear weapons and this number could double by the end of the decade. Seven or more countries are pursuing biological weapons, including at least two, Iraq and Syria, that have ballistic missiles.

The Soviets are even more threatened by this disturbing trend in world armaments because regional hot spots are closer to them than to us. This "common problem" should encourage greater cooperation between the United States and the Soviet Union in ensuring a stable strategic regime in which we enjoy the security provided by effective defenses against limited ballistic missile attack.

This incentive for international cooperation in providing such protection is illustrated by concrete past events—which may be the pattern of things to come. Moammar Qhadaffi has the distinction of firing the first ballistic missiles at the West in the wake of our bombing raid on Tripoli in 1986. Fortunately, they fell short of their targets on the Italian island of Lampedusa. Notably, he said at the time that had he possessed missiles of sufficient range, he would have attacked the United States. Saddam Hussein made a similar statement long before the recent Gulf war, and his actions during that war make clear that such were not idle threats.

But this surely was no surprise because Saddam Hussein had learned of the utility of the ballistic missile to inflict terror on the citizens of Iran during the eight-year Iran-Iraq war. Then, he succeeded in forcing the evacuation of Tehran and disrupting the economy of Iran. He also used chemical weapons against his own people.

IMPLICATIONS OF THE GULF WAR

Shortly after the beginning of Operation Desert Storm, Saddam Hussein again attempted his tactics of terror against the cities and citizens of Israel and Saudi Arabia. Fortunately, he underestimated how the introduction of Patriot air defense system with its anti-tactical ballistic missile capability would frustrate his strategy and tactics.

In my judgment, important lessons learned from the Patriot-Scud duel include:

—We cannot rely solely on the threat of retaliation to deter potential adversaries from acquiring and using ballistic missiles. (Indeed, Patriot was of strategic political importance, because it helped to frustrate Saddam Hussein's apparent strategy to break up the Alliance by provoking Israeli retaliation; defense and continued restraint was a better Israeli option.)

—Preemptive strikes against mobile missile launchers, before they send their weapons of terror on their way, are not completely effective.

—Thus, missile defenses are needed to protect our forces, citizens and friends against the not-unlikely use of ballistic missiles in possible future regional conflicts.

—Space-based sensors are very important to achieving effective ground-based defenses, even for theater applications.

—Defenses do not need to work perfectly to be useful; at the same time it is clear that future defenses must improve on the demonstrated Patriot capability.

—The value of defended areas and of enabling policy options must be considered when calculating the cost effectiveness of missile defenses. (The fact that Iraqi Scuds cost far less than the Allied efforts to counter them had little relevance to the now well understood value of Patriot.)

Clearly, we did not anticipate the full effect of Iraqi ballistic missiles or the importance of our having an antitactical missile system. Lieutenant General Charles Horner, Commander, U.S. Central Command Tactical Air Forces, is reported to have observed: "I underestimated the political impact of the Scud. . . . A lousy weapon, a terror weapon . . . a miscalculation, defused only by the success of Patriot . . . Patriot success also has exposed a hole in the Allied arsenal, Patriot is a point defense weapon, areas to be defended in Saudi Arabia are concentrated in a few, small clusters. If the Allied military targets had been spread out, there wouldn't be enough Patriots in the world to defend."

According to Aviation Week, General Horner went on to project the implication of these observations into the future by noting: ". . . when very accurate missiles with mass destruction warheads are available to Third World nations, the U.S. will need a regional, wide area defense force to duplicate on a grand scale the Patriot's pivotal role of defanging the Scud."

My office checked with General Horner to see if Aviation Week had accurately reflected his views—and he confirmed that the report was correct.

Of course, the implications are broader than theater missile defenses. Former Secretary of State Henry Kissinger, who was a principal architect of SALT I and the 1972 ABM Treaty, recently surveyed the broader strategic consequences in discussing "A Sea Change in U.S.-Soviet Relations" in the April 2, 1991 Washington Post. He observed that: ". . . limitations on strategic defense will have to be reconsidered in light of the Gulf War experience; no responsible leader can henceforth leave his civilian population vulnerable."

It is difficult to imagine a better validation of President Bush's redirection of SDI and continued approach to our negotiations with the Soviet Union than the clear lessons of the recent Gulf War.

REFOCUSED SDI PROGRAM—GPALS

In his January 29, 1991, State of the Union Address, President Bush referred to GPALS when he announced: "I have directed that the SDI Program be refocused on providing protection from limited ballistic missile strikes, whatever their source. Let us pursue an SDI program that can deal with any future threat to the United States, to our forces overseas, and to our friends and allies."

The GPALS system offers global protection against limited ballistic missile strikes, regardless of their points of origin." "Global" means world-wide, continuous coverage. "Protection" means we intend to destroy virtually all of the attacking reentry vehicles (RVs). "Limited" means up to about 200 RVs.

The GPALS system is similar to the Phase I system in that it is a layered defense and it contains several of the same space- and ground-based assets. However, GPALS, as a stand alone, marks a break with the previous SDI concept of phased deployments. A decision to deploy additional systems beyond GPALS would have to be made in the future, based on strategic circumstances.

By destroying a significant percentage of thousands of Soviet RVs, a Phase I defense would deny Soviet planners confidence that they could achieve their war aims—and so strengthen deterrence. With GPALS, we are focussing on protection, and I emphasize protection rather than deterrence, against limited attacks—about 200 RVs. Previously, this objective would have been met along the way to deploying a Phase I defense. Now, a GPALS deployment is aimed at achieving this objective, which we now consider a valid objective in its own right. Subsequent deployments that go beyond the GPALS program could achieve Phase I objectives, which also remain valid military requirements. Of course, decisions on future deployments would be taken based on future circumstances.

In adopting this new strategy, we are deferring the previous linkage between Phase I development and deployment, involving kinetic energy systems, and follow-on development, involving directed energy systems. We intend to maintain robust technology development programs for directed energy systems, but we have no current plans to move any into the formal demonstration/validation phase for a particular system concept.

A full GPALS system would eventually be less than half the size of a Phase I system, and planning from the outset would fully integrate TMD, U.S. ground-based defenses against strategic ballistic missiles, and Brilliant Pebbles which could provide continuous, world-wide defense against ballistic missiles with ranges greater than a few hundred miles. In pursuing the President's strategy, we intend to develop the technology and, as it matures and is proven, move to deploy defenses in an evolutionary approach. With the Congress' support, we believe deployment of the next generation of TMD systems could begin by the mid-1990s, and of a full GPALS system by the end of the decade.

In line with Congressional direction to accelerate TMD efforts, the Secretary of Defense has directed that SDIO accelerate the development of a range of options for deployment of improved TMD systems in the mid-1990s. SDI had previously pursued research to provide advanced TMD possibilities—but not as part of the Phase

I architecture, and not with the high priority now assigned to them. In response, to the Secretary's direction, and this new priority, we have reorganized within SDIO to elevate the management of these more robust TMD programs to the Deputy level, a general officer equivalent position. The reorganization also creates, at the same organizational level, a Deputy for Strategic Defense, who will be responsible for overall integration of the GPALS system and all program elements associated with both U.S. ground-based systems to defend against strategic ballistic missiles and space-based defenses, i.e. Brilliant Pebbles.

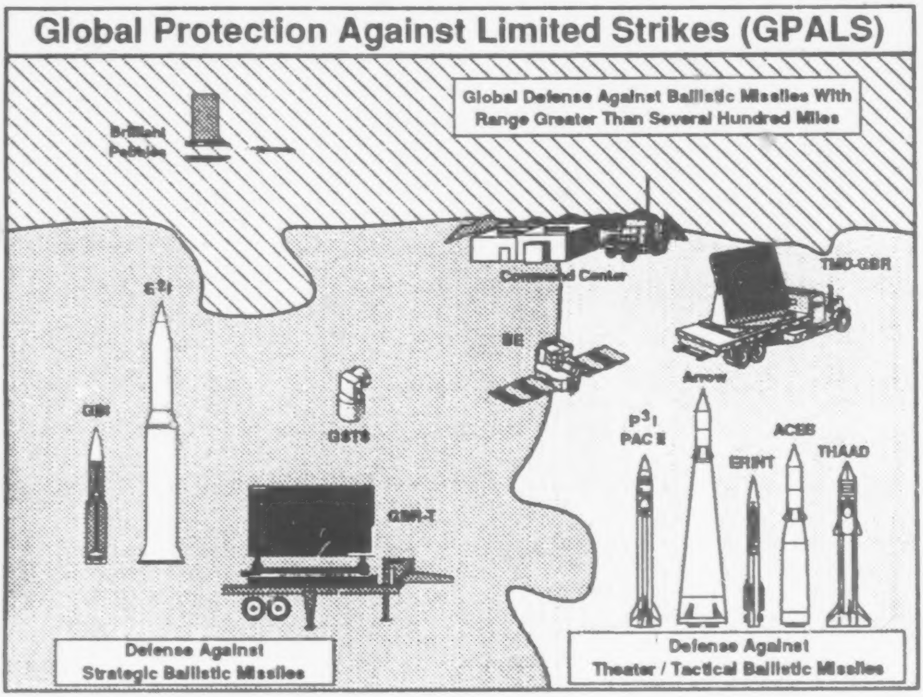

Global Protection Against Limited Strikes (GPALS)
Global Defense Against Ballistic Missiles With Range Greater Than Several Hundred Miles
Brilliant Pebbles
Command Center
TMD-GBR
BE
E^{2}I
GBI
GSTS
GBR-T
Arrow
P^{3}I PAC II
ERINT
ACES
THAAD
Defense Against Strategic Ballistic Missiles
Defense Against Theater / Tactical Ballistic Missiles

FIGURE 1

As noted above, the GPALS elements will be developed and deployed in an evolutionary manner. The first increment will be for TMD, such as near term upgrades to the Patriot system and, by the mid-1990s, wide area defenses in response to our growing concerns about the proliferation of ballistic missiles of increasing range, lethality, and sophistication. Space-based assets, such as Brilliant Eyes and Brilliant Pebbles, could be deployed a few years later to provide global surveillance and protection for the U.S., our forward-deployed and power projection forces, and our friends and Allies. Space-based sensors will play an important role in improving the effectiveness of all ground-based defenses, including theater defenses. U.S. ground-based defenses against long range strategic missiles would be deployed concurrently with and depend upon Brilliant Eyes for tracking and discrimination information.

Brilliant Pebbles, the space-based interceptor of the GPALS architecture, will be an autonomous system that, once activated, positions itself in the path of an incoming missile and by force of its impact destroys the attacking missile or warhead. It also will provide a warning cue to enable Brilliant Eyes and the ground-based tier of GPALS.

A misconception is that Brilliant Pebbles could not be employed effectively to counter tactical or theater ballistic missiles. If the range of the missile is greater than a few hundred miles and the apogee not less than about 60 miles, there would be enough time for Brilliant Pebbles to conduct an intercept. The modified Scud missiles launched by Saddam Hussein during Operation Desert Storm, for example, could have been intercepted by Brilliant Pebbles.

Theater class ballistic missiles typically fly so-called minimum energy trajectories which provide the maximum range possible for a given missile. At the expense of range, the maximum altitude of the trajectory can be reduced by flying what is called a depressed trajectory. In principle, this can deny access by Brilliant Pebbles to ballistic missiles providing they remain below about 60 miles altitude. But modifying a given missile to fly such a depressed trajectory is not a trivial undertaking. Keeping the maximum trajectory altitude below that which can be reached by Brilliant Pebbles becomes more and more difficult as the ballistic missile attack range is increased. This is because the ballistic missile must have extra fuel capacity and/or reduced payload and because guidance, control, and atmospheric heating become more difficult problems. Soon, beyond some range, an entirely new missile would be required, not a simple modification. We are still exploring where this breakpoint is, but it is likely to be at a ballistic missile range considerably less than 600 miles. We are also exploring technologies that could reduce the minimum altitude limits for Brilliant Pebbles intercepts, which would make trajectory depression less effective.

The U.S. ground-based defense segment of GPALS could be deployed in the late 1990s. To ensure coverage of the entire United States, including Hawaii and Alaska, approximately six sites would be required for ground-based interceptors. The number of required interceptors would depend on the specific requirements and the apportionment of missions between Brilliant Pebbles and the ground-based interceptor. We anticipate that about 1,000 Brilliant Pebbles and about 750 ground-based interceptors would be involved.

There are two competing ground-based interceptor concepts: the exoendo-atmospheric interceptor (E^2I) and the ground-based interceptor (GBI) E^2I performs its intercept high in the earth's atmosphere, where atmospheric drag will decelerate lighter decoys, stripping them away from the reentry vehicles. The key technical challenge is to ensure that sensors function properly in the face of severe atmospheric heating. GBI intercepts reentry vehicles outside the atmosphere and avoids the stressing sensor requirements of E^2I, but must resolve the very difficult midcourse discrimination problem. Whether we proceed into full scale development with one or the other interceptor concept, or both, depends on our progress in resolving the two critical technical problems: atmospheric heating for E^2I and midcourse discrimination for GBI.

This past year, we had successful tests demonstrating steady progress in developing both of these ground-based interceptor concepts—in my judgment justifying continuing demonstration/validation testing of both to provide concurrent options for full-scale development in the mid-1990s. In so deciding, I overruled recommendations of the Midcourse and Terminal Tier Review (MATTR) to defer GBI (add the associated GSTS program discussed below) in favor of E^2I as the terminal tier interceptor. This recommendation reflected their judgment that the midcourse discrimination problem is more difficult than the atmospheric heating problem. If forced to choose now between these two options, I would concur with the MATTR recommendation. But GBI could be substantially less expensive than E^2I if tests over the next several years demonstrate that the difficult discrimination problem can be solved—and I believe there is a good chance we may succeed.

In this regard, I would note the enthusiasm of some, based upon the impressive success of the January 28, 1991 ERIS test, to freeze on current technology and commit to GBI as an early deployment option. To yield to this enthusiasm would be out of kilter with the best advice I have received, would divert our course into a technological cul-de-sac, and would prematurely commit us to an approach before critical data are obtained to evaluate our ability to solve the midcourse discrimination problem. I should also note that this "early deployment" option also would fail to meet the Nitze Criteria which were set forth in Section 222 of the FY86 Defense Authorization Act as necessary conditions for deployment of a strategic defense system.

However, I would emphasize that we intend to pursue all our demonstration/validation activities so we obtain, at the earliest possible time, hardware that could be deployed. The best illustration of this approach is the baseline program we have selected for THAAD (theater high altitude area defense) With the necessary funding, I intend to pursue this same course with all potential GPALS elements.

I might note that I have given a special charge to my Systems Architect, Dr. Edward Gerry, to oversee all of our work to deal with reactive countermeasures, including those affecting the midcourse discrimination problem so important to selecting between E^2I and GBI. SDIO is spending over $400 million this year for studies, tests and systems development to ensure that a strategic defense system will be effective against possible Soviet and other countermeasures. In addition to Dr. Gerry's oversight responsibilities, these critical activities are reviewed periodically by external experts on the SDI Advisory Council, the Defense Science Board, and the JASONs.

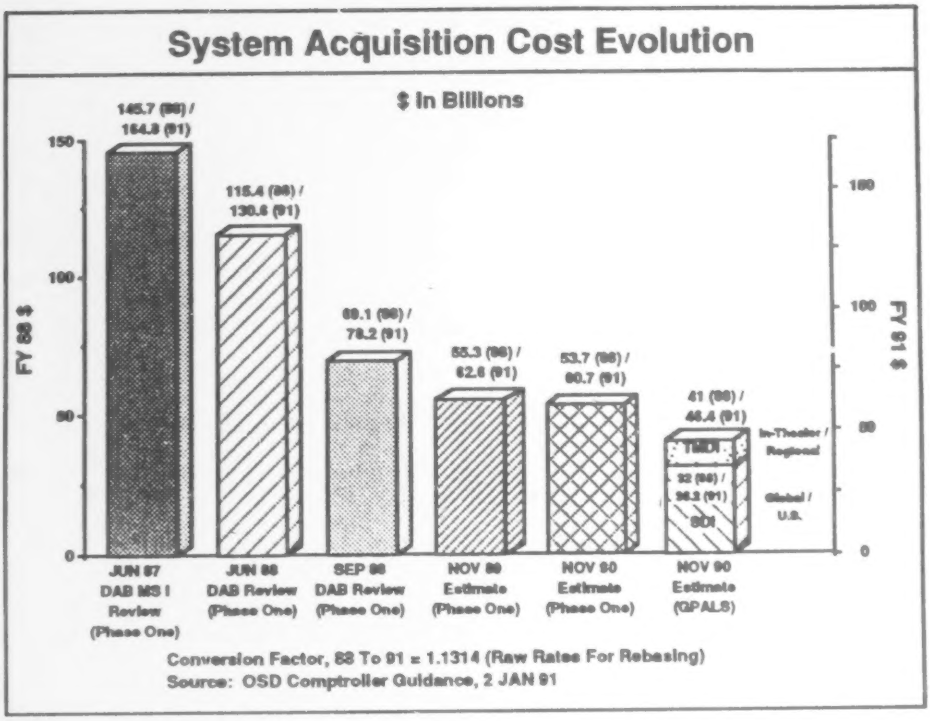
An effective U.S. ground-based system is critically dependent upon development and deployment of the space-based surveillance satellite Brilliant Eyes to provide initial track information to aid in solving the midcourse discrimination problem and to cue E^2I/GBI into the correct battle space. The ground-based surveillance and tracking system (GSTS) remains a sensor option that could fill gaps in the late midcourse battle, particularly in conjunction with a GBI deployment. The ground-based layer also incorporates the ground-based radar (GBR) which is much smaller and more mobile than in the previous Phase I architecture. The GBR will have a modular design so that the radar for E^2I involves four modules of the radar developed for TMD.

Technical progress is being made on all fronts. I have mentioned the impressive progress demonstrated by the recent HEDI and ERIS experiments. Although less graphic, steady progress is also being made with Brilliant Pebbles. Notably, laboratory testing has improved our confidence in achieving our goals for miniaturizing the electronics, propulsion, and sensor elements of the Brilliant Pebbles design. We are completing the pre-FSD contract selection and will shortly be integrating those activities with our continuing effort, led by Lawrence Livermore National Laboratory, to demonstrate key functional capabilities. Our test program is proceeding well, although at a slower pace than we had hoped.

Mr. Chairman, I would observe that our overall architecture involves a reasonable balance between space-and ground-based sensors and interceptors. Our development, testing, and deployment strategy follows an evolutionary and integrated approach. Evolutionary, because it develops first the technology that offers the nearest term application and builds upon it this means ground-based tactical/theater ballistic missile defenses will mature first, we anticipate by the mid-1990s. Integrated, because from the outset we are planning an architecture which will maximize the ultimate GPALS system effectiveness, particularly from a battle management and command, control, and communications perspective. And our program is demonstrating good technical progress on all fronts justifying, we believe, confidence that we can develop and deploy an affordable, effective GPALS system during this decade

GPALS FUNDING REQUIREMENT

An important result of the new GPALS approach is that the outyear funding requirements will be reduced substantially below previous estimates for a Phase I system. The overall acquisition cost of GPALS is estimated to be about $41 billion (FY88 dollars): $22 billion for U.S. ground-based defensive system; $10 billion for Brilliant Pebbles, the space-based defensive system; and $9 billion for an improved TMD capability.



System Acquisition Cost Evolution

Conversion Factor, 88 To 91 = 1.1314 (Raw Rates For Rebasing)
Source: OSD Comptroller Guidance, 2 JAN 91

FIGURE 2

Figure 2 presents the evolution of system acquisition cost estimates since the first Defense Acquisition Board (DAB) review for the old Phase I architecture. By November 1990, advances in technology and architectural simplifications had led to reductions from about $146 billion to about $53 billion. Note that the elements of GPALS associated with the old Phase I architecture (which are reduced in number) are estimated to cost $32 billion—a reduction of about $20 billion from the Phase I cost estimates last November. We are currently estimating that $9 billion will be required to acquire the TMD system.

These are acquisition costs. The 10-year operations and support (O&S) cost for Brilliant Pebbles and the ground-based U.S. defense elements are estimated to be about $9 billion (in FY88 dollars), or slightly less than $1 billion a year, beginning when these elements would be deployed in the late 1990s. Approximately 20 percent of these O&S costs are for Brilliant Pebbles; the remainder supports the elements of the U.S. ground-based defense system. We are working with the Services to provide 10-year O&S estimates for the TMD element of GPALS.

INVESTMENT STRATEGY

The SDI program is being structured to achieve the GPALS objectives in an orderly manner, as the technologies are tested and proven—and to maintain research and development activities which would permit growth to more capable defenses, such as Phase I, should a decision be made to do so in the future.

Initial deployments in the early 1990s, would involve block changes to Patriot, followed by ERINT (extended range interceptor), a limited area hit-to-kill interceptor, which will, if successfully demonstrated, quadruple the firepower of Patriot. We are working with the Israelis to develop Arrow and, should they decide to do so, deploy it by the mid-1990s. Arrow or THD, which we are challenging U.S. industry to bring in within the same time frame as Arrow, will increase by a factor of 10 to 100 the area that can be protected by a Patriot battery. Given the necessary funding, research and experimental work could provide options to deploy Brilliant Pebbles and ground-based defenses against strategic ballistic missiles by the late 1990s.

To repeat, early deployments have to do with theater, not strategic, defenses in the first half of the 1990s. Defense for the American people against intercontinental range missiles would not come until late in the 1990s—and then only if the Congress appropriates the necessary funding.

Figure 3 illustrates, in FY91 constant dollars, the overall investment strategy for the SDI and TMDI programs, over a 20-year time frame. We constructed this presentation to address questions raised during last year's Congressional debate regarding affordability of the SDI program. In this context, some questioned the realism of previous SDI plans for a $12 billion annual budget request in the mid-1990s. To respond to these concerns, SDIO's current investment strategy (shown in the lower profile, labeled SDI) calls for annual budget requests in the outyears that are greatly reduced from previous DOD planning.

We established a limit at $6 billion in the mid-1990s, for the historic SDI programs, and the Brilliant Pebbles and U.S. ground-based defense system programs have been paced to lead to the concurrent deployment possibilities mentioned above.

The big reduction from the President's FY91 budget request was the largest by far of three consecutive years of cuts. In FY92, the President's request would restore SDI to its FY88 funding level, in constant dollars, counting DoE funding, as shown in Figure 3. Such a level is necessary if we are to develop and deploy defenses for the American people by the end of this decade.

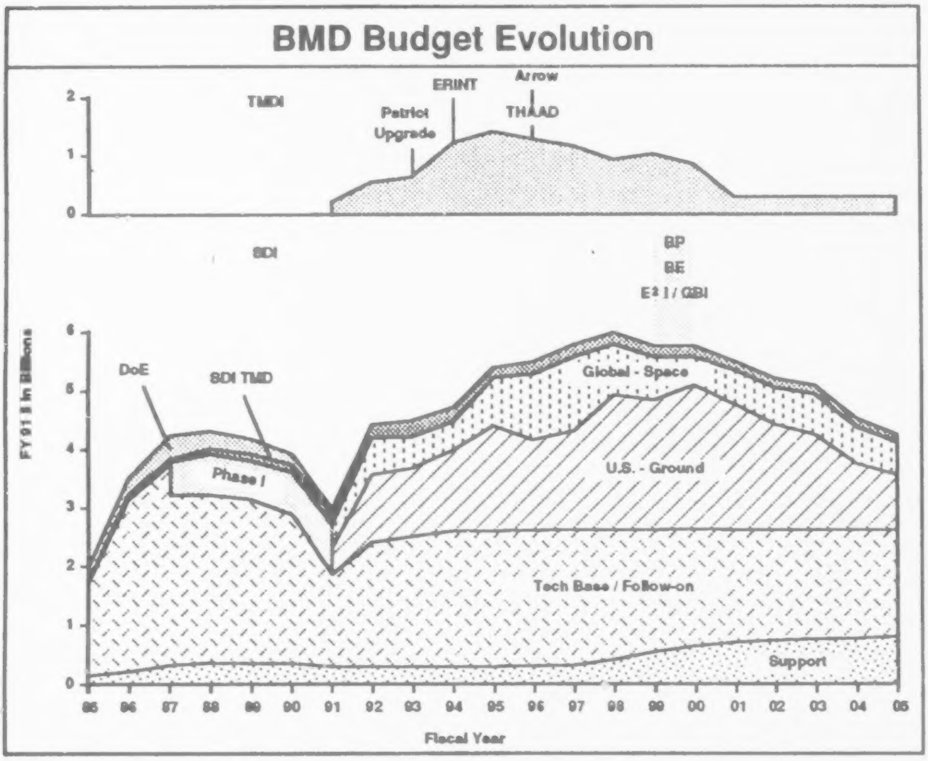


FIGURE 3

Figure 3 illustrates that, since 1981, we have been directing significant funds toward the serious development (in the acquisition sense, but not development in the ABM Treaty sense) of space- and ground-based defensive systems. SDI is no longer just a tech base or research program as it was for the first two to three years of its existence.

At the same time, Figure 3 also shown that last year's severe cut reduced the support for the technical base and the follow-on activities to a lower level than in FY85, the first year SDI received appropriations. This was a very painful cut. As you may know, SDI supports a significant percentage of the top twenty technologies critical to future U.S. national security interests. And this work can pay great dividends not only for us, but for the entire defense and commercial sector. For example, we have discovered that ultraviolet emissions from threat rockets are orders of magnitude higher than theory had predicted, opening up a whole set of possible new applications, including improved discrimination, localization, and tracking of threat rockets.

The upper profile in Figure 3 indicates the budget requested for the Theater Missile Defense Initiative (TMDI) the new line item established by the Congress last year to focus on the accelerated deployment of improved theater missile defenses. TMDI involves predominantly ground-based interceptors—although we have begun to consider the technical feasibility, performance, and cost trade-offs associated with sea- and air-based launch platforms as well.

Counting TMDI, we intend to invest fully three times as much in ground-based defensive systems (including ground- and space-based sensor elements) as in Brilliant Pebbles. This clarification of our investment strategy refutes the claim that the rest of the program is being indirectly taxed to support our space-based tier, Brilliant Pebbles.

Identified in Figure 3 are target deployment dates for various theater defense elements during the first half of this decade, as discussed earlier. The deployment dates for defenses for the American people against long range strategic ballistic missiles could come in the late 1990s, as illustrated by the vertical shaded region.

The affordability of GPALS can best be viewed in the context of overall DOD strategic spending. The strategic portion of the DOD Future Year Defense Program (FYDP) for FY92–97 represents a rebalancing by the Department based on an assessment of strategic forces priorities for the 1990s. This funding is displayed in Figure 4. Despite a declining strategic budget over this period, the strategic portion of the GPALS program is fully funded and, at its peak, comprises only about 20 percent of the current strategic budget and less than two percent of the total DOD current funding.

I wish to emphasize that, if Congress doesn't rectify the impact of last year's budget cuts by meeting the President's FY92 request, which restores our budget to the total constant dollar funding level appropriated to SDI in FY88, deployment of effective defenses for the American people will likely slip into the next century.

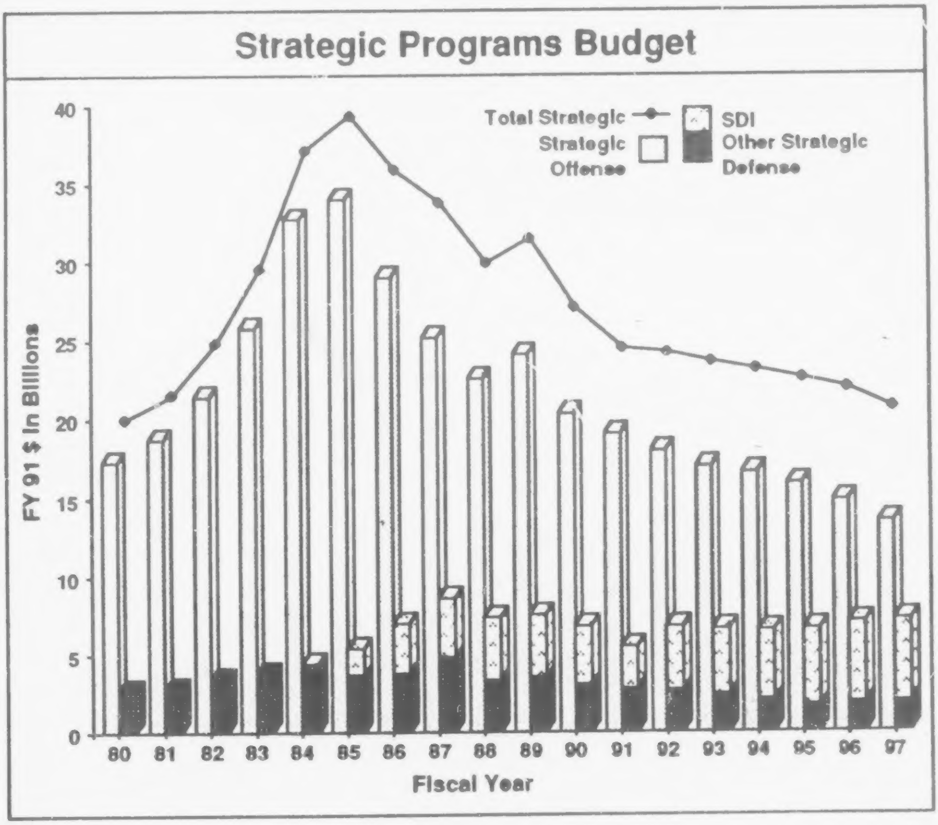


FIGURE 4

INVESTMENT STRATEGY FOR SPACE- AND GROUND-BASED DEFENSES

Figure 5 depicts the history and near term plans for our investment in the space- and ground-based defensive systems. As you can see, we were investing about the same level for the space and ground tiers prior to last year's inclusion of Brilliant Pebbles—and we intend to invest considerably more on the ground-based tier. (Introduction of Brilliant Pebbles, which is an autonomous system, resulted in a reduction of almost $20B from the cost of acquiring the old space-based interceptor system which required BSTS and SSTS as supporting space-based sensors.)

The President's FY92–93 budget calls for returning the investment in R&D for the space-based tier to its previous level while considerably increasing that on the ground-based tier until, in FY93, we are planning to spend three dollars on the ground-based tiers for every one dollar we spend on the space-based tier.

As noted earlier, three-fourths of the total investment to acquire the entire GPALS system is expected to be for the ground-based segments (to defend against tactical/theater and strategic ballistic missiles).

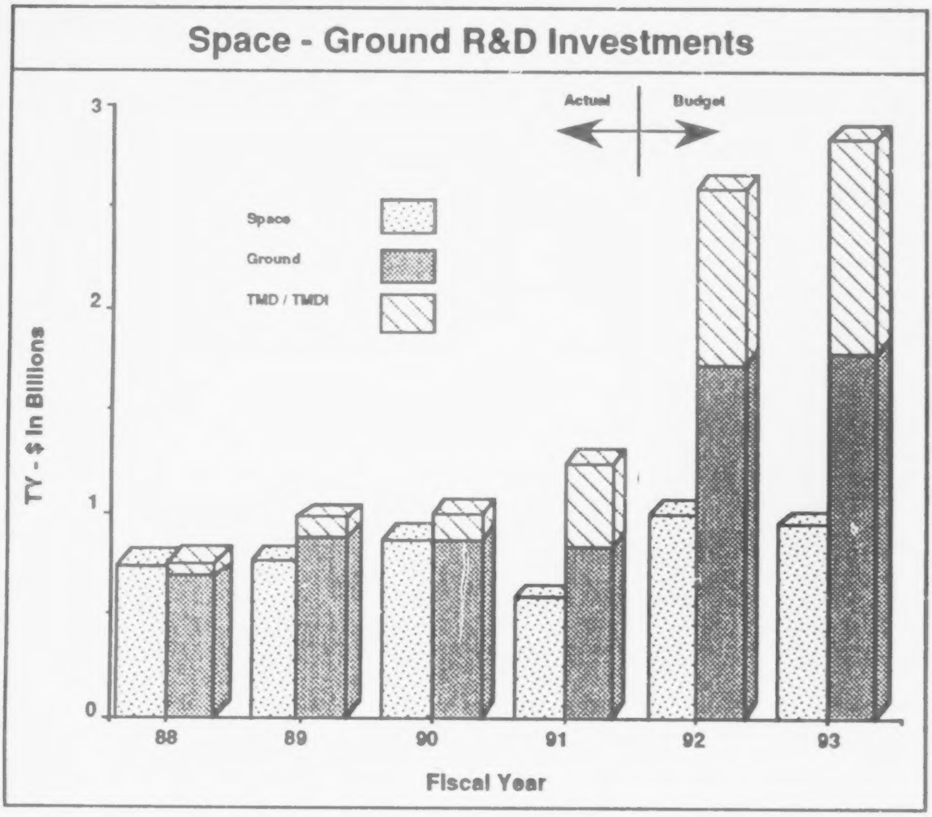


FIGURE 5

APPORTIONMENT OF FY91 CONGRESSIONAL CUTS

Given this overall investment strategy, let me give some general observations about how we distributed the 35 percent reduction from the President's FY91 budget request (from $4.46B to $2.89B). This was a real cut from the FY90 funds managed by SDI of over $600M, leading to termination costs of some $32M, severe curtailment of work on promising technologies, and at least a two year delay in the development activities that could lead to the deployment of defenses for the American people—now delayed until the late 1990s.

Congress imposed a 35 percent reduction from the President's FY91 budget request for the overall SDI program. By comparison, we reduced by 36 percent the total R&D investment supporting the space-based tier of GPALs (which could, on a continuous basis, defend against ballistic missiles launched from anywhere in the world to anywhere else over a few hundred miles away). This means that we are investing 32 percent less than last year on the space-based tier.

At the same time, we reduced our investment in R&D for ground-based defensive systems against strategic ballistic missiles by only 22 percent from the President's budget. By retaining essentially the same level of funding as in FY90, the ground-based U.S. defense system is assured a deployment option for the same time frame as Brilliant Pebbles, i.e., near the end of the 1990s.

Mr. Chairman, I hope you will agree that the above investment strategy is not unbalanced in favor of Brilliant Pebbles, the space-based tier of GPALS.

BALANCE BETWEEN NEAR AND FAR TERM TECHNOLOGIES

Now let me turn to the issue of balance between near and far term technologies. The severe FY91 congressional cuts, which reduced the President's budget request by 35 percent, were allocated as follows:

—33 percent was absorbed by GPALS elements as demonstration/validation programs were stretched by at least two years.

—36 percent was absorbed by directed energy programs, requiring delays and/or cancellation of several promising technology demonstration programs.

—31 percent was absorbed by basic phenomenology and technology programs resulting in substantial curtailment in investigations of survivability, lethality, discrimination, simulation, new materials, cryogenic coolers, on-board high-speed signal and sensor data processors and innovative science and technology.

Mr. Chairman, I understand there have been concerns regarding the curtailment of directed energy weapon (DEW) programs—and the free electron laser (FEL) and STARLAB work in particular, but I assure you that last year's appropriations left me with no way to continue them at their programmed levels while maintaining a balanced overall program.

I truly regret that we could not afford to continue STARLAB, which had an excellent technical track record, which would have flown on the shuttle next year, and in which we had invested over $600 million. But, if we had continued the necessary funding to maintain STARLAB, it would have been at the expense of canceling all three DEW field demonstration programs, i.e., for chemical lasers, neutral particle beam (NPB) systems, and FEL. As it was, I had to severely restrain two of the DEW programs and scale back the third from a field demonstration to a technology base program. Faced with that hard choice, and after considerable study, I decided to scale back the FEL program.

As I indicated previously, in adopting GPALS as our program focus, we have relaxed our objective of reaching an early concept definition/validation decision for directed energy defensive system concepts. At the same time we intend to maintain a vigorous technology demonstration program in this area.

ARMS CONTROL IMPLICATIONS

Mr. Chairman, I am very sensitive to the concerns of many in the Congress regarding the ABM Treaty. We are conducting the SDI program consistent with all international agreements, including the ABM Treaty. In addition, as a matter of U.S. domestic law, we have constrained our experimental work according to Congressional direction whose effect is that we not initiate funding of long lead items unique to any experiment that, when conducted, might exceed the limits of the so-called "narrow" interpretation of the ABM Treaty.

I would note that the pace of our current research and experimental work has been impeded by these constraints. Our experiments, which are being designed as much by legal restrictions as by sound engineering principles, take longer, are more costly and involve greater risk than would be the case if we were free to pursue more direct testing during the demonstration/validation phase. Presuming that we are to proceed at the currently planned pace into full scale development, we will have to begin within the next two or three years spending funds for long lead items currently prohibited by the congressional language. We will need to work with Congress for relief from the long-lead language, which is more constraining than the ABM Treaty.

Furthermore, I believe we must be absolutely clear about the fact that the deployment of any meaningful defense against strategic ballistic missiles, either space- or ground-based, would require a relaxation in ABM Treaty restraints. For example, approximately six ground-based sites are needed to provide coverage of the United States, including Hawaii and Alaska. So, it is clear that to provide even this protection for all Americans against limited attacks, we must go beyond the one site permitted by the 1972 ABM Treaty, as amended in 1974.

In the meantime, there is nothing whatsoever wrong with our efforts to demonstrate the feasibility of, and prepare options for, such defenses. Indeed, as Marshal Grechko stated in 1972, when as the Soviet Minister of Defense he presented the ABM Treaty to the Supreme Soviet for ratification: "There are no limitations on research and experimental work aimed at defending the country against ballistic missile attack." Such research and experimental work is precisely what SDI is about.

Here, it should be understood that the ABM Treaty itself explicitly acknowledged in 1972 that the strategic situation could change and provided a means for its own amendment. It is precisely the recently changed and currently changing strategic situation that has led President Bush to direct us to refocus the SDI program on developing GPALS. So, we are continuing to seek to negotiate with the Soviet Union an agreement that will account for the changing strategic situation. Specifically, in the Defense and Space Talks, we are seeking agreement on a cooperative path to deploy defenses, beyond the current terms of the ABM Treaty, should the research and experimental work prove them feasible of protecting the American people, our forces overseas, and our friends and Allies against ballistic missile attack.

Moreover, I believe it is important to note that Presidents Bush and Gorbachev agreed in their joint statement at the conclusion of their 1990 Washington Summit: "To pursue new talks on strategic offensive arms and on the relationship between strategic offensive and defensive arms. The objectives of these negotiations will be to reduce further the risk of outbreak of war, particularly nuclear war, and to ensure strategic stability, transparency and predictability through further stabilizing reductions in the strategic arsenals of both countries. This will be achieved by seeking agreements that improve survivability, remove incentives for a nuclear first strike and implement an appropriate relationship between strategic offenses and defenses."

Because it addresses ballistic missile threats of mutual concern—accidental and unauthorized launches and third world proliferation—I believe GPALS will facilitate progress in our negotiations with the Soviets.

PROSPECTS FOR THE FUTURE

Finally, Mr. Chairman, I want to emphasize that this is an absolutely critical year for SDI. Last year's cuts severely wounded the program; in my judgment, reducing it to a subcritical status—probably to less than what would have been spent on the key SDI technologies had there never been an SDI program. I would like to work closely with members of the Committee to develop the necessary bipartisan support to restore SDI to a healthy program, and by the end of this century, to provide viable defenses to protect the American people, our forces overseas, and our friends and Allies against limited missile attacks, regardless of their source.

Let me close by quoting President Bush who said on March 22nd of this year: "The primary limit to our ability to develop the technology necessary for ballistic missile defense is our commitment to do so. The pace of our research has been limited not by technological difficulties, but by Congress' unwillingness to fund SDI adequately. I have listened to the concerns of Congressional leaders and taken into account the changing strategic environment. As a result, I have refocused SDI's priorities to provide protection against limited ballistic missile strikes. Now it is up to Congress to respond by supporting my request for SDI funding."

COST OF GPALS

Senator INOUYE. I thank you very much, Mr. Ambassador. The staff analysis of fiscal years 1992–97 defense spending relating to GPALS has about $37.5 billion for research and development. The analysis also suggests that there must be at least $30 to $50 billion for deployment and operation. What is your estimate of the total cost of GPALS? That is in research, development, procurement, deployment, and operation.

Ambassador COOPER. Could you repeat those numbers, sir?

Senator INOUYE. Well, for fiscal years 1992–97, the staff analysis shows about $37.5 billion to be just for research and development of GPALS, and deployment and operation would cost about $30 to $50 billion more. We have no precise figures. Would you give us what your estimates would be for the full spending, research, development, procurement, deployment, and operation?

Ambassador COOPER. Yes, sir; in fact, one of the things we did this year, Mr. Chairman, was to take a look at the overall costs of a full deployment on a 20-year time period. And that is what I have illustrated in the chart here. I believe this is the first time we tried to look at the issue as a complete package. And we sought to be responsive to the debates in the Senate and in the House last year as to the affordability of the SDI program.

And as I indicated in my testimony, if you had looked at last year's POM, it would have had a bow wave that would have exceeded the top of this chart in, I believe, the 1996 time period. It was $12 billion or so in the 1996 time period. So I have severely restrained the program in adapting it to the new scope defined by the President.

What is below the green line, in that chart, is associated with the technology-base and follow-on activities. This, I believe, is what you probably referred to—I am not sure that is the total of the R&D, but that is the underlying technology base to support any serious development program, as well as the widely scoped work that we do on directed energy systems and on innovative science and technology and so on.

What is above the line has to do with serious development activity directed explicitly toward the GPAL system. And as I indicated, the total investment there for the system in this time period would be about $10 billion for the Brilliant Pebbles, which is the global strategic part at the top; about $22 billion for the ground-based part, which includes as a part of the system, a proliferated satellite system, which is necessary for making an overall viable system work; and another $10 billion is associated with the theater missile defense line, which is up above.

And that is separate from the SDI funding. It was established as a separate line last year by the Congress. The bulk of that money is in production dollars, full-scale development dollars, and is associated with the conventional forces line—the conventional programs, rather than strategic programs.

There is no full-scale development money in the SDI line, I believe, for the next 2 years. Beginning in the next 2 years, there will be long-lead, full-scale development moneys, and that is the point at which we begin to run into the treaty constraints that I mentioned in my testimony.

I will have to get for you for the record the numbers of precisely what is in the future years defense plan, the 1992 through 1997 time period. But the spending rate in the green is somewhere between $2 and $2.5 billion per year. That is technology-base work. What is above that is the serious development work for GPALS. And as I gave you the bottom lines, the sum is like $32 billion.

[The information follows:]

For the Fiscal Year Defense Plan, the President has requested $41.979 billion which includes $36.633 billion for research and development, $4.873 billion for procurement, and $0.473 billion for construction.

CONGRESSIONAL REDUCTIONS

Senator INOUYE. As I indicated in my opening remarks this morning, we will be considering two of the most controversial items in the budget, the B–2 and SDI. There is a possibility that once again Congress may cut the overall budget request. If that happens, will you suggest that the theater and tactical missile defense programs be cut?

Ambassador COOPER. No, sir; as I indicated, the early deployment options that we are seeking are all in the theater missile defense area. And they are in the first one-half of the decade. Those funds are, in fact, separate. There is within the SDI program, I believe, some $280 million, or thereabouts, funded for much of the integrating task that goes with the separate TMDI line. But we have set up a separate organization within SDI to manage the theater programs and have no intention of slowing that work down. It has the highest priority both from the Congress and from my instructions from Secretary Cheney.

Senator INOUYE. Mr. Ambassador, are these numbers correct now? The latest numbers for GPALS suggest that acquisition costs are $57.6 billion, including theater defenses, and $23.2 billion for O&M—a total of $81 billion. Does that make sense?

Ambassador COOPER. Are those then-year dollars, sir?

Senator INOUYE. I believe so.

Ambassador COOPER. If those are, then-year dollars, I think they do make sense. I would add one asterisk, and that is that we do not have estimates at this point for the O&M or O&S dollars for the theater defense. That is an issue that is still being worked on with the services. But for the operations and support for Brilliant Pebbles and the U.S. ground-based defense, we have a basis for making such estimates and the numbers you gave me sound reasonable. I would have to check the O&S one, but it, in fact, is collaborated by the numbers I just was given for the then-year dollars for GPALS and as far as R&D goes.

STATUS OF ARROW

Senator INOUYE. At this moment, the United States and Israel are negotiating the cost-sharing arrangements for the Arrow. What is the present status?

Ambassador COOPER. We are still in the midst of those negotiations, sir. We are, I hope, near the conclusion, both on language that would satisfy both sides with respect to the control of the technology that will be developed under the Arrow program and with respect to the cost-sharing ratio.

Senator INOUYE. How would you compare the performance of the Arrow and the upgraded Patriot?

Ambassador COOPER. Well, by the upgrade, do you mean the current Patriot, PAC–II, or the one we hope to have working in a few years, which would be PAC–III, sir?

Senator INOUYE. PAC–III.

Ambassador COOPER. The Arrow will have a lethal or kill radius, defense radius substantially greater, actually, than both of the ones I mentioned—greater than PAC–III—and it will be able to intercept missiles higher than PAC–III. Where the current Patriot can kill missiles coming in out to 10 to 20 kilometers, perhaps the Arrow system will triple that.

The THAAD system, which is the other—it is on the chart—is the U.S. broad area defense. We believe it could have capabilities out to from 100 kilometers to perhaps 300 kilometers, depending on whether or not we had a space-based sensor system that could provide cuing information which would greatly extend the footprint. But Arrow will be much more capable than Patriot. That is one of the reasons why the Israelis were focusing their support on the Arrow system prior to the gulf war, rather than on upgrades to Patriot. Now they are interested in both, I believe.

Senator INOUYE. The development in phase 1 was 80/20, was it not, on cost sharing?

Ambassador COOPER. Yes, sir; we did negotiate one item separately—I have forgotten what it was—that was near 70/30. But the bulk of it was 80/20.

Senator INOUYE. Can you tell us what we are asking for now?

Ambassador COOPER. I would prefer not to do that, sir. We are in the midst of the negotiations. I would discuss that with you separately, if you like, or in closed session.

COMPLIANCE WITH ABM TREATY

Senator INOUYE. You have indicated that you will do everything to stay within the narrow interpretation of the 1972 ABM Treaty. But when we get to the development, testing, or deployment period, will that require amending or abrogating that treaty?

Ambassador COOPER. I am careful in trying to answer your question, Senator Inouye, because as you know, the dispute over the broad/narrow issue is one that I think we all would like to avoid while focusing on what we need in the way of developing defenses.

The narrow interpretation of the treaty will clearly be breached, though, at the point of entering full-scale development—at the point where you would test items at an operational level and also at a system level. In fact, most, if not all, DOD acquisition programs do that as a part of the demonstration and validation phase, which is where we are with Brilliant Pebbles and Brilliant Eyes and all of the elements for GPALS.

If we did not have the congressional constraint today, we would be doing tests differently than the ones we are doing. The 1995 time period is the point where we are talking about full-scale development. And if we go into full-scale development, we will have clearly crossed the line. The congressional constraint today is that we cannot spend money, long-lead money, buying targets or preparing the ranges or whatever to conduct those tests with what we are spending in the program. We would run into those long-lead constraints in 2 to 3 years from now.

Current testing does not go across that line in the 1992 or 1993 budget. But beyond that, we will have to talk to the Congress about relief from the constraints on purchasing long-lead items. In the 1995–96 time period we would have to come back to the Congress in discussing funds for actually conducting tests that would go beyond the narrow interpretation.

Senator INOUYE. Thank you, sir.

Senator Johnston?

Senator JOHNSTON. Thank you, Mr. Chairman.

ROLE OF BRILLIANT PEBBLES

Ambassador Cooper, you say in your written statement that the Brilliant Pebbles has the capacity to shoot down a theater weapon, as long as it goes above 60 miles. But it would be safe to say, would it not, that SDI, that is to say Brilliant Pebbles, is principally a defense against the Soviet Union for the United States and that TMDI is principally a theater defense against the Iraqis, the Syrians, or others who have less capable ballistic missiles? Is that fair?

Ambassador COOPER. I would quibble with that statement, Senator Johnston.

Historically, what you say is absolutely correct. And it was in the context of a massive attack. And the argument for Brilliant Pebbles was attacking the Soviet missiles when they still had all of their RV's on board in the boost and postboost phase and establishing a layered defense.

In the GPALS context, where the concern is 100 to 200 reentry vehicles, that objective is less important. It does not go away, but it is less important. And the objective of trying to provide a worldwide defense for contingency plans and on a continuing basis, I think, has a place for Brilliant Pebbles that we never considered in the past.

Senator JOHNSTON. In other words, are you afraid of any other country now getting strategic nuclear weapons?

Ambassador COOPER. Whether the weapons are strategic nuclear or chemical or biological. I would just note that in the gulf war had the Iraqis had the CSS–2 instead of the SCUD, they could have held at risk many of the capitols throughout Europe and there would have been serious questions, I believe, as to whether or not we could have held the coalition together.

COST OF BRILLIANT PEBBLES

Senator JOHNSTON. But what I am getting at is if it were not for the Soviet threat, you would not go to Brilliant Pebbles because Brilliant Pebbles is much more expensive. There would be a cheaper way to do it by Arrow or THAAD.

Ambassador COOPER. No, sir; that is the part I think deserves a closer look.

As I said, the Brilliant Pebbles, we believe, would cost about $10 billion. And if you examine the cost of giving continuous coverage from Arrow or THAAD at the variety of capitols through Europe and in the East, I think you would find that that is not a smaller number.

Senator JOHNSTON. I thought that I was reading here that six TMDI sites within the United States, including Hawaii and Alaska, would cost $9 billion. That is not correct?

Ambassador COOPER. No, sir; the theater missile defense is for the Patriot upgrades, for the Arrow system, for THAAD, and they would be deployed, perhaps on board ships, perhaps endogenously in the theater as Patriot has been in Germany and is now in Israel. Or they might be kept in the United States as many of the Patriots were and then deployed to a hot spot as they were needed.

The ground-based defense for the United States would, indeed, involve six locations, but that is associated with a system that would cost some $22 billion.

Senator JOHNSTON. That is $22 billion?

Ambassador COOPER. Yes, sir.

DECISION BETWEEN GBI AND E^2I

Senator JOHNSTON. All right. You say that you are trying to make a decision, that you have not yet made a decision between the GBI and the E^2I. And you point out on page 9 of your statement that one of the reasons that choosing one of these options would not meet the Nitze criteria. Is that correct?

What you say is that, I should also note, that this early deployment option would also fail to meet the Nitze criteria which was set forth in section 222 of the fiscal year 1986 defense authorization, as necessary conditions for deployment of the strategic defense systems.

Ambassador COOPER. That is referring to, not GBI so much as it is the ERIS. In other words, if you were to freeze the state of technology and seek to deploy the ERIS missile in a treaty compliant way—that is what I was addressing in this paragraph—I believe we would have a system just as we had in 1972, that would not meet the Nitze criteria. That is correct, sir.

Senator JOHNSTON. When you say to freeze on current technology and commit to GBI's and early deployment options, you are referring to committing GBI, are you not, as opposed to E^2I?

Ambassador COOPER. I was referring to the ERIS experiment.

Senator JOHNSTON. I think if you will read that, in paragraph 9, your two midparagraphs, you are not referring to ERIS, you are referring to E^2I, a decision between E^2I and GBI.

Ambassador COOPER. No, sir; as I read it, I was referring to the enthusiasm of some, as I said, based on the impressive tests of ERIS to freeze the technology here and to commit, in the GBI program, to that technology as an early deployment option.

It is an important point you are on because, in fact, it is why I am making the argument. The GBI program is, I would say, midstream at this point. You may recall that in 1984, I think it was, there was an experiment where we hit a missile over Kwajelein with a HOE, a homing overlay experiment, it was called. That experiment weighed over 1 ton. The one we used in the experiment back in January of this year weighed some 300 pounds, I believe, something of that order. And within half a decade, we anticipate that the weight of the interceptor will be down to some 10 pounds, perhaps.

And that system will not be reliant upon the ground-based radars that we used in Safeguard. It will be part of a complex, which I believe, will be survivable and cost effective at the margin.

Senator JOHNSTON. As I read what you were saying here, you were talking about the requirement of GBI having interactive discrimination and E^2I being able to solve the problem of entry in the atmosphere and the heat problem.

In any event, the point is that you say to make an early determination between the two would violate the Nitze test. My question is, under no circumstance, it seems to me, can you meet a Nitze test if all you are doing is intercepting 200 RV's and your cost is, what, $41 billion in 1988 dollars or $81 billion in then-year dollars; is that not correct?

Ambassador **COOPER**. The Nitze criteria had to do with the cost effectiveness at the margin, separate from the investment, if you will, for the system.

If we deployed the system and the Soviets were to seek to overwhelm that system by simply adding offensive weapons capability, what would be the relative cost of that increment of offensive capability versus the relative cost of the defensive capability? And I believe that the ground-based interceptor or E^2I can possibly satisfy the Nitze criteria. It depends on whether we can work the discrimination problem on the one hand or the atmospheric heating problem on the other.

Senator **JOHNSTON**. Let me ask it this way, Ambassador Cooper. The requirement is 200 warheads. I know I read that.

Ambassador **COOPER**. Yes, sir.

Senator **JOHNSTON**. And you mentioned that the then-year cost would be $81 billion. As I figure that out, that is $402 million per warhead intercepted. Is that right?

Ambassador **COOPER**. I am sure your arithmetic is correct, sir; yes, sir.

COST OF SS–18

Senator **JOHNSTON**. What is the cost of an additional SS–18? It is not $402 million?

Ambassador **COOPER**. You're taking the total investment cost, as I understand it.

Senator **JOHNSTON**. Actually, it is not the total investment cost because it does not include the $20-odd billion that has already been invested. So consider that already gone. If we are talking about what it is going to cost us in the future, it costs us $402 million apiece to intercept one warhead that cost them, what? $10 million, $20 million to deploy?

Ambassador **COOPER**. I do not know what the number is, sir. I will have to go look at it. But the SS–18 is an expensive missile. But in dealing with the marginal costs, it seems to me that the issue is what does it cost to defend against an additional SS–18 warhead. Those numbers we have worked, and it is favorable to the defense by a large margin.

Senator **JOHNSTON**. As I recall, the MX missile was going to cost us around $16 billion to deploy 500 warheads.

Ambassador **COOPER**. Yes, sir.

Senator **JOHNSTON**. Which I think is about $32 million apiece, something like that. Is that about right?

Ambassador **COOPER**. I do not remember what the MX program was to cost for deployment. The whole R&D program was considerably more than that. I think that it is a couple of hundred million dollars a missile, is it not? That is what we generally think for an MX. So it is on the order of $20 million a warhead, something of that order. But I should go check that number.

MEETING THE NITZE TEST

Senator JOHNSTON. The point is, we are talking about $20 million RV's that it is going to cost us $400 million to intercept. Now how does that possibly—that misses the Nitze test by 20 times, does it not? Or do I misunderstand the Nitze test?

Ambassador COOPER. I think you are mixing apples and oranges, quite honestly, Senator, because the Nitze test has to do with the marginal costs, that is what it cost for one more defensive element and what it cost for one more offensive element, not the total investment. And the numbers that you are working on for the defense, I do not believe were the marginal costs. It included the total investment costs of buying whatever it is that we were talking about as the GPALS element. And the marginal costs would be less than that.

But more than that, if the issue is to take issue with Nitze criteria in the GPALS context, I totally agree with that. I think that is one of the things that is evident out of the gulf war experience; namely, that the value of what you are defending has to enter the equation. I do not think anybody regrets the investments that we made in trying to counter the SCUDS, although the SCUDs were clearly a lot less expensive.

Senator JOHNSTON. When you say we made, you do not mean SDI, you mean——

Ambassador COOPER. I mean the U.S. Government, in that war and our troops in the field; yes, sir.

Senator JOHNSTON. You would not, then, argue with me that it would cost 20 times as much total cost to intercept a warhead, assuming it works and assuming your cost estimates are correct, than it would cost to deploy it, roughly. You just disagree that—you would say that that is worth it to do that.

Ambassador COOPER. The research and development for the GPALS, in fact, is disproportionately large as compared to other systems because we are not buying a very high rate. The Brilliant Pebbles' R&D, for example, is on the order of one-half of the cost of the 1,000 interceptors you would deploy. If you were to deploy another three or four times that many, it would not double the cost, it would increase the cost by 50 percent.

So that is what I was getting at as the marginal cost.

BOOST PHASE INTERCEPT

Senator JOHNSTON. Do I understand that we are no longer going to have boost phase intercept?

Ambassador COOPER. No, sir; the Brilliant Pebbles is capable of boost and postboost phase intercepts. The only qualifier is, provided the missile does not fly too rapidly. And SS–25's, for example, cannot really be intercepted in boost phase by Brilliant Pebbles. There is not enough time to do it with a single RV missile. They are quite effective against SS–18's, quite effective against the submarine-launched missiles in boost phase.

Senator JOHNSTON. With just 1,000 Brilliant Pebbles, you can intercept the SS–18's?

Ambassador COOPER. Yes, sir; it depends, again, on the orbital constellation, but yes, sir.

Senator JOHNSTON. But you could not get the SS–25's?

Ambassador COOPER. The SS–25's you couldn't get with 4,000 either. It is a kinematic problem that the missiles fly out faster than you can reach down. That is in boost phase. You can intercept the SS–25 in its midcourse phase from space as well.

Senator JOHNSTON. With respect to the Soviet Union, this is really an accidental launch system, isn't it?

Ambassador COOPER. Accidental and unauthorized is the term I would use, sir.

MANAGEMENT OF BRILLIANT PEBBLES

Senator JOHNSTON. All right. Are Brilliant Pebbles—have you made the decision whether they would be independently controlled, or whether they would be controlled by—what do we call it?

Ambassador COOPER. A centralized manager?

Senator JOHNSTON. Yes.

Ambassador COOPER. They would have to be authorized. They couldn't intercept without prior authorization. Once they are authorized, they are capable of then engaging in the battle autonomously.

In other words, each of the Pebbles, once authorized, can look and see a rising missile or set of missiles and then decide on its own which of the missiles is its best target, and it also makes up a battle plan for its neighbors, for that matter. So it knows, generally, what the neighbors would do. The computer is that capable. It makes up its mind and goes, and then informs the neighbor what it's doing. And, of course, it informs the manager on the ground what it is doing. It can be overruled at any time.

I am sure you know that the Patriot worked on automatic. In some sense it is like that. Once it is engaged, it is automatic. But it takes a man to engage it. It takes a man in the loop to engage it.

Senator JOHNSTON. I know in Patriot, but on SDI you would have a man in the loop?

Ambassador COOPER. Yes, sir.

NATO THEATER MISSILE DEFENSE INITIATIVE

Senator STEVENS. Would the Senator yield there, one minute? I have an appointment with the chairman and ranking member of the committee, and I just have one basic question to ask the Ambassador.

As you made the presentation, I want you to know that I do support the evolution of this plan. I think the President is on the right course and you are too. But it appears to me that our European partners and allies have a great stake in the theater missile defense initiative, and that they should be deeply involved in that as well as we. We have a greater worldwide posture and I believe we should maintain it.

To what extent are the NATO allies pursuing a similar concept are willing to pursue the theater missile defense initiative and the time table that you have outlined?

Ambassador COOPER. We have had several discussions bilaterally and collectively with various groups within NATO. It is clear to me that our allies are rethinking their position regarding the deployment of defenses and that they were doing that before the outset of the gulf war, at least the ground war part. They have not, I believe, arrived at positions yet, as to how they would proceed. I completely agree with the thrust of your question and comments. I think there is good reason to believe that we should be able to put some sort of cooperative program together in the theater defense area.

Senator STEVENS. Well, I would urge you to do that. And I think that some of us ought to help you because it does seem to me that we still have the global responsibility. I heard Shevardnadze the other night talk about the fact that stability in the Soviet Union is a worldwide concern now. And he remarked that after all there still are a great many intercontinental missiles around his country. And it does appear to me that we have the major responsibility still in the Brilliant Pebbles area, but that the theater missile defense concept ought to be apparent now to our allies, that they have a serious threat coming at them, which is not necessarily intercontinental. And that we ought to find a way to make sure that they are going to be on board and are going to participate. I do not think we can finance both of those objectives at the same time.

Ambassador COOPER. Yes, sir. May I add one thought, Senator Stevens, as you are leaving. We have, of course, had programs in cooperation with our allies all the way along. And we have had them evaluating Brilliant Pebbles as well as other things that we are doing, including some of the countermeasures work. I believe as they think through the issues, as I was expressing to Senator Johnston, they may change their attitudes about Brilliant Pebbles, as well. Because it does, in fact, provide continuous coverage everywhere. And it avoids the intrusive aspects that goes within deploying defenses on the ground everywhere.

But I certainly agree with the sense of your comments and we will be working with our allies to try to build efforts of cooperation.

Senator STEVENS. Thank you, Mr. Chairman.

Senator JOHNSTON. Mr. Chairman, I just have two quick question, if I may.

INTERACTIVE DISCRIMINATION

First of all, what is the mechanism that GBI would use for interactive discrimination? Is that the neutral particle beam?

Ambassador COOPER. We are examining the neutral particle beam, but we are also looking at the chemical laser and the possibilities that it might use interactive discrimination. But the neutral particle beam, I guess, has gotten the main focus in this area; yes, sir.

Senator JOHNSTON. Is it thought that you need interactive discrimination if all you are doing is protecting against accidental launch or unauthorized launch?

Ambassador COOPER. Not in the near term. Certainly not with respect to third countries. And depending on what the Soviets do, perhaps not there in some extended time to come.

One of the notable things I mentioned in my statement, which maybe slipped by quietly, is that the level of deployment that we are talking about with GPALS, both of the space- and ground-based elements, does not in any way pose a threat to Soviet retaliatory capabilities. And if we could get them to understand what our objective is, I do not believe they would be strongly motivated to go to what we judge to be very expensive programs, to develop countermeasures to what we would deploy initially.

REFOCUS OF SDI

Senator JOHNSTON. Now finally, you refer to the President's statement on page 5 of your statement, in which he says, "I have directed the SDI program be refocused and talk about the limited ballistic missile threats." And then he adds a second sentence. He says, "Let us pursue an SDI program that can deal with any future threat to the United States, to our forces overseas, and to our friends and allies."

By that second sentence, the President did not mean to go beyond limited ballistic missile strikes, did he?

Ambassador COOPER. Not at this point, sir. I mean, we want to maintain a vigorous research and development activity that will provide contingencies for the future. I am sure that you have read in the paper the various suggestions that the Chief's are on a different wavelength than we are in doing the program. I do not believe that is true. Phase I——

JCS REQUIREMENT

Senator JOHNSTON. Is there, by the way, a JCS requirement for GPALS?

Ambassador COOPER. There is a requirement as a part of phase I for a significant portion of GPALS. And previously, phase I, it was argued, was the smallest deployment that made sense. Generally Herries, I believe, took that position before the Congress, and it has been the position——

Senator JOHNSTON. That was about 1,800——

Ambassador COOPER. It is up to several thousand reentry vehicles that would be coming in in the attack. And the interceptors would be double the numbers I was talking about on the ground; four times in space. But as a part of getting there, it was always part of the JCS requirement to provide effective defense against limited attacks. What is new is that we would say, let us go and do that, and agree to do that. And that is all we budgeted it for. There is not money in my budget to go beyond that.

That does not mean that the requirement for phase I has gone away in the JCS's mind.

Senator JOHNSTON. You are deciding not to decide.

Ambassador COOPER. On anything beyond GPALS. That is right sir.

One more quibble on my answer, because I do not want to mislead you. What is new with GPALS is not only the limited scope of the U.S. defense, it is also the inclusion of theater defenses and an integral part of the command control structure. And the JCS is reexamining their position on the requirements for theater defenses, particularly in light of the gulf war, where it is now evident, I think, that we need broader area defenses than was previously covered by their requirements.

Senator JOHNSTON. Thank you, Ambassador Cooper.

Thank you, Mr. Chairman.

Senator INOUYE. Thank you.

Senator Cochran.

ORIGIN OF GPALS

Senator COCHRAN. Thank you, Mr. Chairman.

Ambassador Cooper, one observation and a question about your reaction. And that is the development of this new program, which you refer to as GPALS, actually was begun before the Persian Gulf war experience. And so it is not driven soley by the Persian Gulf experience, is that not correct?

Ambassador COOPER. Yes, sir; that is absolutely correct. Immediately after beginning this administration, President Bush set into motion a number of studies because it was clear that there was a change in the East-West relationship going on. It accelerated over the past year. And in particular, I was—in the midst of it, I was asked to do an independent review of the SDI program: I reported it out last March and recommended the approach that we are now taking, in effect.

There were a series of intensive studies done both on policy and on some of the technical issues over last summer and fall. The Secretary agreed with the outcome and by then I was in the Government. We presented this to the President and made recommendations to it. And he called it his own. It just happened to coincide almost with the outbreak of the ground war.

In my view, the events of the gulf war, though, are a confirmation, or a validation, of an approach that we were already on and that the President had recommended for us to undertake before the outbreak of that war.

PRESIDENT'S SUPPORT

Senator COCHRAN. I have heard a few critics of the proposal say that this is not a program that has full support within the administration. Is that a fair criticism of this? Is this not a proposal of the President and is this not a budget request that we are receiving from the administration?

Ambassador COOPER. Yes, sir; without a doubt, it is the President's proposal. When we briefed him on this subject, we aired all sides of the issue. All his senior advisors in the National Security Council were there. The President decided to go in this direction. He could, after all, had just let us continue, go down the road, and if it worked out, claim credit as the Reagan-Bush program. If it did not, he could have disowned it. He chose to highlight it in the State of the Union address. I believe it was the only—I know it was the only defense program, and I think, only overall Government program that he did highlight. So I do not think that there is any question of the President's support or the Secretary's support, or General Powell's support, or any of the other senior leadership in the building.

I think in a time of constrained budgets, as we have right now, there is obviously a fight for dollars. And so we may seem discordant, but I can assure you that there is harmony, I believe, at all the senior levels within the administration on this subject.

POSSIBLE ALTERNATIVES

Senator COCHRAN. With many that carries great weight. Frankly, I know we are in positions of authority and power in the Congress proposing alternatives, but I do not know that there is a basis for credibility in terms of being able to weigh all of the possibilities and bring to bear all of the resources that have been brought to this program's development available to those critics.

I specifically have in mind the alternative that I hear proposed by the Chairman of the House Armed Services Committee, which, as I understand it, instead of a program that has three major pieces to the puzzle, would have only one, and a smaller piece at that. As I understand it, a Patriot-like system, ground-based theater capable only.

Is that your understanding of what that alternative is? And what is your reaction to it as a substitute for this proposal?

Ambassador COOPER. As I understand the position, it is to be serious about theater defenses and to proceed with a robust theater defense, improvements to Patriot, perhaps THAAD, Arrow, all of that. But, in fact, it would provide no serious program for defending the American people. That is my reaction to it. There are insufficient dollars to do either the necessary technology-base work, or the serious development work for a defense of the United States of any sort.

Senator COCHRAN. You mentioned in presenting the GPALS program to us that one integral part of this would be not only ground-based sensors, but space-based sensors, I believe, as well. To what extent would this program be crippled if we went along with the suggestions that some are making that we just forget the space-based program entirely?

Ambassador COOPER. As far as the sensors go, Senator, I would hope that people who are advocates of the ground-based system would come around and understand that they are essential for any meaningful defense in the future. So I would hope we could divide up the argument of space versus ground at least unto the sensors versus the interceptors.

I believe this committee is well aware that in the gulf war, the DSP was used to some utility in cuing the Patriot system, providing warning, as well as other ways. And other space systems were very important there. I believe that even for theater defenses—ground-based, or so on—in the future, we have to have viable space systems that are very much a part of the overall architecture.

The Brilliant Pebbles is another area of dispute. In my view, they have an important role to play both for theater and strategic defenses. And I think it would be a great shame if the Congress were not to permit us to proceed to evaluate how well we can do with this program. We are, in fact, hobbled at this point, even from the point of view of doing operational tests on that concept, by the Congress.

I hope that we can come to terms on the space versus ground issue and understand that the arguments about space, in fact, even predate SDI. In fact, I am certain they predate SDI. And they go back to a time when people argued about whether we should militarize space. And since that time, even the Soviets have acknowledged publicly and in fairly dramatic ways, in my view, the important role of military activities in space. And we know this from the gulf war. And I think we should reexamine what is in our national interest from a first principals perspective about Brilliant Pebbles, rather than getting hung up on the treaty, per se.

No defense under the treaty will provide effective protection of the United States. We have to deal with the treaty, hopefully, in serious negotiations with the Soviets.

Senator COCHRAN. I appreciate your compelling testimony and I am impressed with the new program that has been unveiled and presented to the committee. I hope we will seriously consider approving this and providing at full funding. I do not want to go along right now with the notion that there is no way to win this battle. I know it is an assumption that is being made around there that this is a part of the budget that is going to be cut. And that is really unfortunate, I think. We are just going to have to do a better job of selling and presenting the facts and educating people who remain doubters. I think we may be jeopardizing our Nation's security and the security of the people of the United States if we do not pay attention to the possibilities for enhanced defense if this will provide us.

Thank you, Mr. Chairman.

Ambassador COOPER. Thank you, Senator.

Senator INOUYE. Senator D'Amato.

Senator D'AMATO. Mr. Chairman, I am just going to ask that my statement be included in the record as if read in its entirety.

[The statement follows:]

STATEMENT OF SENATOR D'AMATO

General Butler, what sort of threat is the Strategic Air Command (SAC) projecting when we are secure enough to dismantle early warning systems such as the Over the Horizon—Backscatter (OTH–B) radar, yet insecure enough to justify a second long-range bomber in a decade?

What sort of financial management will allow us to spend an additional $35 billion on the B–2, when we cannot find $1 billion to fix the already operational B–1B?

We are told that the B–2 will play an essential role in regional wars of the future, yet the Air Force is asking this committee to procure the B–2, fix the B–1B, modify the B–52, buy SHAM II and the Advanced Cruise Missile (ACM), and maintain the Air-Launched Cruise Missile (ALCN), SHAM A, and a variety of nuclear gravity bombs, a "laundry list" that doesn't even address SAC's conventional missions.

I am interested in your "dual Triad" concept, General, but I doubt whether we will ever get away from a narrowly focused SAC with an insatiable appetite for ever-larger, ever-more expensive nuclear weapons? Will the first unit of B–2s to stand up immediately begin training for conventional as well as nuclear missions? If so, what ratio of conventional to nuclear training do you anticipate? What can you tell me about conventional weapons development for strategic bombers, particularly the B–2?

Senator INOUYE. Senator Specter.

Senator SPECTER. Thank you, Mr. Chairman.

ABM TREATY INTERPRETATION

Ambassador Cooper, I compliment you on the work that you are doing on the strategic defense initiative. I might say very briefly for the record that I have profited from your experience in the field.

The meetings that I attended with you in Geneva when you were Deputy to Ambassador Kampelman were most helpful.

My question to you, to move right to the core of what I consider to be an important issue is, if the broad interpretation of the ABM Treaty was followed by the United States, how much faster could we proceed with the processing of our strategic defense initiative research and development? May I say, parenthetically, that I, after extensively examining the negotiating record, the Senate hearings, and the subsequent practices of the parties, have concluded that the broad interpretation is the correct one. Note that I have carefully left out deployment, for I am thinking now only about the steps prior to deployment.

Ambassador COOPER. It is a significant inhibition on our programs to be restricted to tests that do not permit operational or prototype-level involvement. As a matter of good engineering practice, you want to do this as early as you can in a program. And in the main, all of the programs in the defense acquisition chain today are encouraged, if not by mandate, certainly by good engineering practice, to do operational testing at the prototype level as soon as possible.

We are restraining our programs by doing several tests instead of one at a prototype level, in piece parts. And then doing analysis to make judgements about whether overall systems would work in order to recommend going into full-scale development. Because of this, we add not only schedule risk, but dollar risk to the program. We put off until full-scale development what one would do years earlier as a competent engineer.

Senator SPECTER. Ambassador Cooper, may I interrupt you to ask you to provide us with as concrete an example as you can, given the open nature of this hearing, as to what you would be doing now under the broad interpretation and contrast it with what you are compelled to do as a result of the prevalence of the narrow interpretation of ABM?

Ambassador COOPER. With respect to the Brilliant Pebbles, which is probably the easiest thing to do, you would build a Brilliant Pebble with its life jacket, and put several of them, in fact, in orbit and have them communicate with each other. Have them launch or move to intercept, maneuver to intercept missiles and work out operational problems.

Senator SPECTER. That is on testing, not deployment?

Ambassador COOPER. That is testing, not deployment. That is a part of the demonstration and validation phase. We cannot get to that form of testing, short of full-scale development. Actually, we cannot even do it in full-scale development as long as we are stuck with the narrow interpretation. You would have to go beyond the narrow interpretation to do the test I just described.

What I am saying is we would be doing that as a part of the concept validation phase. And we would have the data and performance characteristics from which we would form a decision about whether or not to go into full-scale development. We are not permitted to do those tests now. What we do is we test an interceptor from the ground and we test separately the life jacket on orbit and have pieces talk back and forth. We make sure that the interceptor that goes with the life jacket is being tested is not ABM capable from any other test, because if we did, it would cross the line into a capabilities argument.

And so we end up never fully testing the system as a part of the narrow interpretation.

TIME IMPACT OF TREATY INTERPRETATION

Senator **SPECTER**. Ambassador Cooper, given the current objective of the work you are undertaking, what additional time is required as a result of staying with the narrow, as contrasted with the broad interpretation?

Senator **BUMPERS**. Could you repeat that question, Senator?

Senator **SPECTER**. Yes; given the current objective of the SDI program, what additional time is required by staying with the narrow interpretation as contrasted with a time line on achieving your current objective if you were permitted to function under the broad interpretation of the ABM Treaty?

Ambassador **COOPER**. I would have to think about it to give you a clear, quantitive answer. But the process by which we go through compliance review takes time within the building. And whether it is good, bad, or indifferent, it actually took some considerable time on certain systems, tests that we had before. It is conceivable to me that that could lead to many, many months of delay in the early stages of planning, you know, perhaps even years on program.

The problem where you end up at the end of the test program and when you determine you get there, is much more difficult to estimate. My judgment is that we are adding risk and dollars that probably doubles the risk, maybe triples the risk.

Senator **SPECTER**. What do you mean by risk, Ambassador?

Ambassador **COOPER**. Well, when we make estimates for what a system costs, for example, there are estimates made of unexpected things that may happen—the unknown unknowns and so on. The better testing you do the lower the amount of money associated with that risk. So the estimates that we put together for the Brilliant Pebbles, the $10 billion, includes estimates that have a larger factor associated with this aspect of the problem than would be if we were doing more direct testing.

And so it ends up, even in our estimates, costing more money. And I believe, since you do not test the system until late, you have a much greater risk of schedule slips because of something you just forgot or didn't work out properly before you were able to test completely.

There is no simple way of giving you a concrete answer. My judgment is, though, that we are probably losing years—ultimately over the decade, and when we might be able to deploy a system because of these constraints early on.

COST IMPACT OF TREATY INTERPRETATION

Senator **SPECTER**. The other aspect of the consequence of following the narrow as opposed to broad interpretation is the increased costs. You have alluded peripherally to that aspect in your answers.

Is it possible to state what the increased costs are as a result of following the narrow as opposed to the broad?

Ambassador **COOPER**. Let me provide some estimates, if I may, for the record, Senator. I believe in the overall system costs, out of the $10 billion or whatever for Brilliant Pebbles, we are probably paying an extra 10 to 15 percent associated with the risk.

[The information follows:]

All SDI tests are now structured to satisfy that narrow interpretation of the ABM Treaty. It is impossible to precisely estimate time and cost savings without completely redesigning the SDI test program. Nonetheless, we believe savings in time, money, and reduced technical risk would be substantial. One realistic, comprehensive test would replace several experiments. For example, for Brilliant Pebbles alone, testing under the broad interpretation could save up to $1 billion and reduce full-scale development time by 1 year, with significantly reduced technical risk. Such realistic testing would also conform with the recommendations of several independent review groups including the Government Accounting Office.

SOVIET ACTIONS

Senator **SPECTER**. Well Ambassador, I would appreciate that. This is a subject which I have discussed with General Abrahamson some time ago. We have a raging debate in Congress about the strategic defense initiative and how much we are going to allocate for the program. I think it would be very helpful if we knew what the additional time delay will be and what the additional cost will be by staying with the narrow interpretation as contrasted with the broad interpretation.

If you could submit that for the record, I would appreciate it.

One other question, Ambassador Cooper, and that is what is the Soviet Union doing with respect to the narrow versus broad interpretation as they are proceeding with their own version of the strategic defense initiative?

Ambassador **COOPER**. I frankly do not know the answer to that. We know they continue to invest a great deal of money in all their strategic programs, including defenses. Their emphasis has been on ground-based defenses and continues to be. And as far as I know, they are not testing anything like the Brilliant Pebbles, although I am not sure how much one would see, at least if the tests were of the sort that we are conducting and infer what they were doing from them. That is one of the difficulties of some of this, that is, the verification problem.

I think that the Soviets do not have the technology that we are exploiting in both the Brilliant Pebbles and the ground based interceptors. And as you know the broad/narrow debate was an argument about future system concepts and how to deal with them. I do not believe the Soviets are ready to step into that realm just yet, so it is not surprising to me that we do not see a lot of evidence of the testing of the so-called future systems.

Senator **SPECTER**. Well, if you would acquire any information on that, I would appreciate it if you would consider that as a continuing question because the unique consequence of the debate on the ABM Treaty was that the United States would be bound by the narrow interpretation even if the Soviets were not limited and could follow the broad interpretation. This puts the United States at a substantial disadvantage of having a treaty interpretation which gives the Soviets broader rights than does the United States because of the argument that the United States' rights are limited by what was represented to the Senate.

Thank you very much, Ambassador Cooper.

Thank you, Mr. Chairman.

Ambassador COOPER. Thank you, Senator. You know, just speaking personally, that I quite agree with you on this issue.

Senator SPECTER. I do know that. Thank you.

Senator INOUYE. Senator Bumpers, I have been advised by Senator Domenici that he has a very important engagement at noon.

Senator BUMPERS. I have an even more important engagement. No; I am kidding. That is fine.

THEATER DEFENSE

Senator DOMENICI. Any engagement you have is far more important, but I appreciate it. I was here and had to leave to go do a little errand over there at Budget Committee. I will only take 5 minutes. Thank you, Senator.

Mr. Ambassador, I having some difficulty understanding some of the verbiage here. First, could you tell me about this theater effort that the Congress mandated. It really is not part of SDI, is it?

Ambassador COOPER. I am not sure exactly what you mean by that. It is a separate program line established by the Congress last year. It is budgeted separately. And as I indicated earlier, and maybe you were not here, the full-scale development and production funds will be provided out of the conventional program's budget, not the strategic program's budget, as SDI is.

The Secretary appointed me, or directed me, to manage the program—the Theater Missile Defense Program. So it is a separate program. It is managed within SDI. It is managed in a way that is integrated within SDI so that we can take advantage of the technology that has been developed all along. Most of the programs—in fact, all except the Patriot upgrade—have their antecedents in programs that were developed in SDI in the past. And there will continue to be money spent under SDI toward theater defenses. But the TMDI line is, in fact, a separate line.

Senator DOMENICI. I guess what I want to try to establish is that in debating the strategic defense initiative and your programs we are talking about a total program including the theater portion which is under your jurisdiction. Is it fair to say that the theater system is not aimed at intercepting an intercontinental ballistic missile?

Ambassador COOPER. That is correct, sir; it is not.

Senator DOMENICI. So to the extent that it does something, it is not intended to intercept intercontinental ballistic missiles, which was the SDI thrust when it was initiated. Is that a fair statement?

Ambassador COOPER. I think that is a fair statement. You have to remember that some of these Third World countries are getting ever more capable missiles and pretty soon they are going to cross the line themselves.

Senator DOMENICI. Oh, I understand. Now, I am also having trouble—if you take that whole graph you have got there, I am having trouble distinguishing what is GPALS within it and what is it not. Can you tell me?

Ambassador COOPER. The whole thing is GPALS.

Senator DOMENICI. All right.

Ambassador COOPER. The theater defense is, in our mind, an element of GPALS. As we learned in the gulf war, DSP, which was a strategic warning system, became an integral part of the system that supported the Patriot.

Senator DOMENICI. OK, let us take the theater portion out of our discussion for a minute and let us talk about the rest of GPALS and the technical base follow-on, the U.S. ground-based components, and the global space-based components. Are you saying that they are all now motivated by a new goal, an objective, which is GPALS?

Ambassador COOPER. Yes, sir; with one exception. And that exception is that we want to assure that we continue a viable technology base that looks into other phenomenologies and other technologies that might be exploited in the future beyond the GPALS and even beyond the phase I kind of defense.

Senator DOMENICI. OK, so any deployment contemplated is really GPALS oriented, but perhaps some of the technology base and follow-on might by its science and physics and technology have more capacity than the GPALS.

Ambassador COOPER. Absolutely; yes, sir.

Senator DOMENICI. There is no prohibition on developing the follow-on technologies. But clearly follow-on technologies are not contemplated for any immediate or mid-term deployment?

Ambassador COOPER. That is correct, Senator.

FOLLOW-ON TECHNOLOGY

Senator DOMENICI. OK, now tell me, how important is the technology base and follow-on to this program as compared with the technology that would go into deployment?

Ambassador COOPER. In my mind, it is of equal importance, because it is the technology that will support and sustain our national security interest into the next century. Many programs, as I am sure you are well aware, included in SDI were moved there from other places at the outset of the program. And this is the only place they reside or where much of it resides. And I think it is not something we can cut out and severely cut into without mortgaging our future in a way that I think would be imprudent.

Senator DOMENICI. Well, as a matter of fact, we had a lot of money being spent for strategic defenses before President Reagan's speech and the creation of an SDI organization. You have suggested that if we reduce funding for this program we may even be at a lower level of spending for strategic defense than where we would have been without such an initiative?

Ambassador COOPER. That is my judgment, sir. I believe we are at that level. Last year the cuts into the technology base put them at a lower level than they would have been last year had there been no SDI. You will note from the chart that they were substantially higher earlier—double the level of last year.

IMPACT OF CONGRESSIONAL REDUCTIONS

Senator DOMENICI. I would like to ask only two more questions. Heretofore when the President asked for a given amount of money and Congress came along and gave substantially less, it was pretty easy for you and your predecessor to say to us, this is what we will take out if, in fact, you reduce it to a certain level.

Now, might I ask, while this Senator may be supporting the entire $4.6 billion for SDI, is it more difficult now for you to tell Congress, if you reduce that level by $1.5 billion—I am just giving you a hypothetical—is it more difficult now for you to tell Congress what you would do than it was before when you were taking out the directed energy research and development and proceeding with the more deployment-oriented technologies and research?

Ambassador COOPER. Senator, I have said that I believe this is an absolutely critical year. I believe that last year the cut to $2.9 billion—whatever it was—cut the program to a subcritical level. By that, I mean you cannot sustain the tech base work that I just argued I think is critical for the country and also pursue any sort of serious development activity. We have been hanging on this year to try to see if we can restore the program to a reasonable level. I do not know how to pick and choose and conduct a serious program if we do not get back to something very close to what the President has requested. I really do not.

Senator DOMENICI. And if somebody wants you not to proceed with—and I am not saying this yet, but I am asking—if they wanted you not to proceed with Brilliant Pebbles, then you would run into whether the President would want to program or not. Is that correct?

Ambassador COOPER. I believe that—well, I hope anyway and I think that the President will strongly support the Brilliant Pebbles as an integral part of GPALS. And as I said, both are strategic and theater roles. I have to remind you though that even if you cut that program out in its entirety just looking at the hard facts, you do not move other things ahead enormously. I do not remember exactly what the budget level is. It is like $600-some million, I believe, for Brilliant Pebbles. As I said, it is $1 out of every $4 that we are spending on GPALS is for Brilliant Pebbles. So——

Senator DOMENICI. Well, let me just for myself tell you, Mr. Ambassador, I think the protection of the technology base in the outyears, as we talked about it heretofore, is as important as any other aspect. And do I read you as saying, without being specific about programs, that you agree with that?

Ambassador COOPER. I do agree with it. And I think, as I said, I believe we cut it too severely last year. That is why I argued it should be increased. I really did scrub the budget last year. If it had been my belief that technology-base and follow-on programs could have been sustained at whatever that is—$1.9 or $2 billion, that is where you would have seen that green line. The reason it comes up is, it is my judgment that there are programs there that we too severely cut in the last year, but we had them hang on for a year. And we are trying to—I will not even say get well, because they do not get well entirely in 1 year.

Senator DOMENICI. Thank you, Mr. Chairman.

Thank you, Senator Bumpers.

Senator INOUYE. Thank you.

Senator Bumpers.

Senator BUMPERS. Thank you, Mr. Chairman.

Welcome, Mr. Ambassador. It is nice to see you again.

Ambassador COOPER. Senator, good to see you again.

CONTINUED CONGRESSIONAL CONCERN

Senator BUMPERS. Mr. Ambassador, let me just start off with two or three observations about why a good number of the Members of Congress continue to be perplexed by this whole program.

No. 1, of course, is the ABM Treaty—except for INF, about the only arms control treaty we still have with the Soviet Union. Now, last year, General Monahan told this committee that the ABM Treaty was not a problem for SDI and would not be a problem before the end of the decade. This year in your testimony, you state that it is becoming an increasing problem particularly with the procurement of long-lead items.

And I want to make this observation. No. 1, we have something of a contradiction between last year's Director of SDIO and this year's. And so we are mildly confused about that.

And let me also say the sooner SDIO—you and SDIO—come to the Congress and say, "Look, here is what we want," and "If we do this, it is going to violate the ABM Treaty," then we can get on with the debate as to whether this country wants to violate the ABM Treaty or not.

No. 2, last year General Monahan told us that Brilliant Pebbles would cost us $1 million each and that included research and development. Now, this year just procurement alone is said to cost $5 billion, and we are talking about 1,000 Brilliant Pebbles. This year you tell us that they are going to cost $5 billion just for procurement. Of course, if you procure 5,000 instead of 1,000, your R&D cost does not go up. But as long as you are just buying 1,000, you are telling us that procurement alone will cost $5 billion. That is a 500-percent increase from what General Monahan, or whoever it was testifying here last year, told us.

Ambassador COOPER. It was Monahan.

Senator BUMPERS. You need a little continuity in this program. But anyway, that is a 500-percent increase. And if you add R&D, that is really a 1,000-percent increase over the information we got last year.

And then finally, the third observation—and Hank, I would like to have your comments on all of these.

Ambassador COOPER. Yes, sir.

Senator BUMPERS. And finally last year, General Monahan testified in answer to a question from Senator Harkin about the effectiveness of this program on short-range missiles:

> Senator HARKIN. Let me explore that just a little bit, because I want to understand it fully. I understand that these Third World missiles have a very short range. I have been hearing about 1,500 kilometers.
>
> General MONAHAN. Against the shorter range missiles, a space-based type of architecture is probably not the sort of thing that would be most effective.

Now, I understood you to say a moment ago, Mr. Ambassador, that these things would be effective against short range ballistic missiles.

Ambassador COOPER. Yes, sir.

Senator BUMPERS. Now, I would like for you to comment on all three of those if you can remember what I just got through saying.

Ambassador COOPER. Right. I am trying to find in the testimony, because I went through last year's testimony. I distinctly remember the question where General Monahan responded that he thought there was 2 years to 3 years before he ran into the funding constraints, very much as I said.

Here we go. It says:

> We can live with the restrictive interpretation up until about 1994, 1995.

This is in answer to a question by Senator Specter on page 441 of last year's testimony.

ABM INTERPRETATION

Senator BUMPERS. If you have his actual quote there, let me ask you this question. Is that a correct statement so far as you are concerned?

Ambassador COOPER. Instead of 1994 or 1995; it would now, I would say, read 1995 or 1996. But you have to be careful because of the long-lead funding restrictions. You have to back up a couple of years in front of that, which is what I was referring to when I said 2 years to 3 years from now.

It is the same point that he is making, that when you go into full-scale development, that is what you have to exceed the narrow interpretation. I will just read the quote to you:

> Normally I do not think that is a key issue.

Regarding the treaty is what he said, the broad/narrow.

> We can live with the restrictive interpretation of the treaty up until 1994, 1995. Sometime when we are in full-scale development in Pebbles or ground-based interceptors, we would finally have to do testing that would require broad interpretation.

That is when you do the testing.

Now the restraint from Congress is that we cannot spend money on long-lead items to do those tests, which sometimes are 2 years to 3 years in advance of the testing. And that is what he is referring to.

Senator BUMPERS. The procurement of the long-lead items themselves does not violate the treaty?

Ambassador COOPER. I would not think so. In fact, my judgment is that the testing does not violate the treaty. But that is another issue. You have to understand that there was a bunch of cuts last year, there was a slip of up to 2 years and we already talked of 1994 to 1995. I would say it is now 1996 or 1997. The year 1996 is where we are calling for full-scale development. So I would argue there is no discrepancy in our testimony in this regard.

IMPACT OF TESTING

Senator BUMPERS. Are you saying, Mr. Ambassador, that the testing is not a problem?

Ambassador COOPER. I say testing is a problem. This may be a difference in our view.

Senator BUMPERS. That is where you and General Monahan have a difference.

Ambassador COOPER. Maybe. I do not believe he would disagree with the engineering judgment that you would want to do operational tests at the system level as early as you possibly could in any serious development activity.

I was in a meeting last week with Mr. Yockey. He is going to be emphasizing preprototype- and prototype-level testing as a part of demonstration and validation of all of our acquisition programs. This congressional restriction precludes us from doing that kind of testing, which everyone, I think, judges to be the most prudent way to go about engineering programs.

With it, of course, comes added risk, schedule, and costs.

Senator BUMPERS. Mr. Ambassador, let me just say that I would like for the Senate, especially, since the Senate approved the ABM Treaty, I would like for the Senate at the earliest possible time to debate whether we are going to go all out and go ahead and violate it. Now we have committed a lot of resources and I know how that goes. Once you get the money committed, people are going to say forget the treaty, we have too much invested to stand on ceremony.

Nevertheless, I think one of the most important debates that we ought to be holding around here is not so much on R&D, because while I have generally opposed SDI because of the treaty, I have always said I would be willing to put $1 billion, even maybe $2 billion, a year into research on it just so we stay up to speed at all times.

I might also say that I think if we had taken that position, we would be billions of dollars ahead right now because this brings me to the next point that I mentioned and wanted you to comment on.

COST OF BRILLIANT PEBBLES

Ambassador COOPER. On the $1 million per Pebble?

Senator BUMPERS. Yes.

Ambassador COOPER. Yes, sir; I am not sure, I will have to look at the numbers. That sounds to me like the production cost, which does not include the launch costs, which sort of doubles it, that number.

The numbers last year, as I recall, were like $1.5 million and including launch, it would have gone to $3 million.

Senator BUMPERS. Per Pebble?

Ambassador COOPER. Per Pebble.

Senator BUMPERS. I will give you the benefit of $1 to $1.5 million because I think that was the figure.

Ambassador COOPER. I think we are still pretty much consistent with that. The other thing that——

Senator BUMPERS. I understood you to say earlier that you were anticipating 1,000 Pebbles to cost $5 billion in procurement.

Ambassador COOPER. I think the number is close to that. That is $5 million per Pebble, instead of $3 million.

Senator BUMPERS. That is quite an increase over $1.5 million.

Ambassador COOPER. I understand, but there is another point that I think you have to bear in mind and that is the incremental cost if you buy 4,600, which he was talking about last year, or whether you buy 1,000. That was my point. If you buy 4,600, then the cost of the system goes up by another $5 billion, roughly, so it is $10 billion divided by 4,600, which is still in the $2.5 million to $3 million per Pebble. If you buy only 1,000, then it costs you more per pebble. That is just the learning curve that goes with production.

I do not believe there is an inconsistency in those numbers, either.

SHORT-RANGE BALLISTIC MISSILES

Senator **BUMPERS**. Let me just make this comment on that point. You stated a moment ago—and the thing that precipitated this line of questioning was that Congress shorted you last year and that this has really created problems for the program and so on. And I am just saying that we have grown rather distrustful because we keep getting conflicting testimony. We have different people before us every year on SDI. I trust you will be with us next year and we will hold you accountable for what you said this year.

But let me just ask you further, about the short-range ballistic missiles.

Ambassador **COOPER**. Yes, sir; I will have to talk with General Monahan. I am not sure what he is referring to. The kinematics, the facts of the kinematics are that if the missile goes above about 60 miles, as I put it, perhaps a little less than that, even, you can intercept it from the Brilliant Pebble constellation. There are arguments people will get into about whether or not if they depress trajectories, you can attack longer range, but still shorter than the strategic range missiles.

The fact of that argument will be, as well, that the Brilliant Pebbles will have capability against all but extraordinarily designed missiles. We used to call them boost glide missiles when we talked about them. As far as I know they never went beyond a paper design for anybody, where they stay within the Earth's atmosphere. Of course, you can go to the limit-and-fire cruise missiles, if you wish, and you cannot reach those with the Brilliant Pebble.

But any reasonably designed ballistic missile that goes further than something on the order of 600 miles—that is 1,000 kilometers—I believe we are going to be able to intercept from space with the Brilliant Pebbles. There are studies underway to look at the measure-countermeasure game right now in an architectural integration study that we have going on. We will be more definitive about our answer in the future, but I think it will be defensible against critical technical review.

BASIC ELEMENTS OF PHASE I

Senator **BUMPERS**. Going back to the reason Congress stays rather confused about these issues and the costs, and one of the reasons we have been hesitant, in addition to the treaty and the conflicting information, let me recite one other thing for you. The SDI report to Congress 2 years ago—that was 1989—listed seven basic elements of an initial phase I system. And of those seven elements, three have been killed outright, two have been substantially changed, and one was killed, but resurrected in a different form, that was ground-based radar, in just the last 2 years.

Now when you consider that much upheaval in 2 years, literally five of the seven essential elements torpedoed, gone, it makes us wonder what the architecture is going to look like 2 years from now. And yet you are asking us for $5 billion. It seems to me that if we had given you all the money you asked for in the beginning and we would still have killed those programs, we would have still wasted that many more billions of dollars.

Ambassador COOPER. I can understand how you might be confused about that. I would like to say, trust me, but I understand that is not a very good answer.

Senator BUMPERS. That has already been used.

Ambassador COOPER. I understand. I think that part of the change in the architecture over the last 2 years came with Brilliant Pebbles. And folks really should understand that the most important thing about Brilliant Pebbles was not the interceptor itself, but the possibilities that that technology brings architecturally. Because it is autonomous, it no longer required the warning input from the BSTS as an integral part of the architecture, so that went out. That was one of the systems that you mentioned went away.

The SSTS is not required for the Brilliant Pebbles, either, because it works all by itself. Previously that was where a lot of the battle management was done for the space-based interceptor. The reductions in cost in the space-based part of the architecture were close to $20 billion with the advent of Brilliant Pebbles.

Now there are requirements for space sensors for the ground-based parts, as I talked about earlier. And as the architecture has evolved, that has come back into the equation. The technology has diffused from the space elements now into the ground-based part.

The ground-based interceptor teams that are the principal competitors—Rockwell International, Martin Marietta, and Hughes—are three of the contenders for Brilliant Pebbles and the technology is common in those, too. So I see a dovetailing, if you will, which will lead to more stability in the architecture overall. And I can assure you that the current architectural study is to refine what I have told you about today, not to come in here next year with a whole brand new element, provided we—it will not be a new element in any case.

I think that we are, in fact, on a stable path at this point architecturally. And I realize that is a complicated way of saying trust me, but there you are.

SOVIET REACTION TO GPALS

Senator BUMPERS. I have been visiting with you in Geneva for several years and I have always found you to be a very candid and intelligent person. And I am very pleased to see you head this program up. I am pleased you are here.

Let me ask you one other thing. GPALS is essentially a program designed to take care of the Hunt for Red October kind of scenario. And from that standpoint it makes a lot of sense.

On the other hand, one of the basic problems I have always had with SDI is bombers, cruise missiles, clandestinely introduced nuclear weapons, certainly the latter would fit the Third World terrorist nation's aims, if they could lay their hands on a nuclear device. But just take our relationship with the Soviet Union which has been very adversarial and gave rise to this whole program.

Let us assume that you are Mikhail Gorbachev's military advisor and you have to say, Mr. President, the United States is going to put a little thing up, it is an intercontinental ballistic missile defense system, but it is limited. They call it GPALS. It will take care of Red October.

But you would also have to tell him that once it was deployed and once you are buying these missiles, say once you are buying Brilliant Pebbles at $5 million per, and the only thing the Americans have to do to increase the umbrella and the total intercontinental ballistic missile defense is just to add more sensors, more Brilliant Pebbles, for a few billion more dollars. What would you advise. First of all, what do you think Gorbachev's reaction would be to saying they are going to violate the treaty, but only in a very limited way? What do you think his response would be?

Ambassador COOPER. My own view is that they would do exactly what they are doing and have done with respect to SDI all along, which is to argue that it will destroy the arms control whole arena and so on, because as long as we stay confused in this country—confused may not be the right word—divided and there is not a serious program, then he does not have to worry about this problem that you just mentioned.

Senator BUMPERS. I think General Akhromeyev has been quoted as saying they are not going to build SDI. The truth of the matter is they cannot build it, they do not have the technology to build it.

Ambassador COOPER. I think the problem is that they think we can.

Senator BUMPERS. You think they can?

Ambassador COOPER. I believe they believe we can; yes, sir.

Senator BUMPERS. They believe we can?

Ambassador COOPER. Yes, sir.

Senator BUMPERS. Oh, yes; I am sorry. I am saying I do not believe the Soviet Union can build an SDI. So I think they will do the only thing that they can do and that is try to overwhelm any kind of a system we build.

Ambassador COOPER. They can build defenses, though, about this common problem. And they are building them. There is a very extensive air defense network and the SA–12 has capability against theater missiles of the sort that we are talking about. It is like the good news/bad news story. It does not have to be as capable because the threat is closer to them, the third country threat, if you will.

On the other hand, they have been working the problem. In our case, it is tougher for the third countries to get to us, they are further away. But when they get there the missiles are going to be coming in faster. It is a greater challenge for us to build a defense against them.

I was repeatedly told by my counterparts in Geneva that the Moscow system had to do with this concern. It is my belief that if there were an agreement ultimately worked out that would expand the possibilities for them to defend the rest of their country, you would see them deploying what they have around Moscow and other places, because they are concerned about what I think is a common problem.

You raise a very real issue, which is, how do you get them to trust us that we will build a small defense which will provide protection which they I think—if you read what they are arguing about in their literature and some are speaking openly about, in fact, publicly—they are concerned about it, too. How will we limit the defense, at least while we are thinking about the future to the point where it does not interfere with the overall strategic United States-Soviet relationship?

And I think that is the challenge for the negotiations. And I personally believe they will—we can come to terms with them, but they are going to resist us. And we have to be the demanderers in this negotiation.

CAPABILITY VERSUS INTENTION

Senator BUMPERS. Did you hear General Butler's statement earlier this morning when he was asked something similar to that? He says, I get paid for measuring capability and not intentions, and to be able to respond to all contingencies. Did you hear that?

Ambassador COOPER. I did not hear it, but I am familiar with the statement.

Senator BUMPERS. You have heard it before?

Ambassador COOPER. Yes, sir; and I believe we should pay attention to capability and not intentions, too. I mean, I do not want to——

Senator BUMPERS. Well, how about them?

Ambassador COOPER. Yes; I mean you take intentions and stated intentions into account, but you realize those can change over night.

Senator BUMPERS. We are sort of asking them to trust us, too, are we not?

Ambassador COOPER. Well, I am saying they can have a defense, too. And I think what we have to do is we have to come to terms with an arrangement, an agreed arrangement, that permits them to defend themselves against what I think is recognized as a common threat and at the same time preserve stability in the broader context.

COUNTRIES WITH BALLISTIC MISSILES

Senator BUMPERS. Mr. Chairman, I have taken too much time. Two quick questions with your permission.

You said in your testimony that 24 Third World nations will have ballistic missiles by the end of the century. Can you name those?

Ambassador COOPER. Not openly, sir; I will provide them for you. I said that it could be as many as 24 I believe. That is what has been testified to by others as well.

Senator BUMPERS. Can you tell us how many of those will have intercontinental ballistic missiles by the turn of the century?

Ambassador COOPER. A small percentage is the judgment. And I do not know the numbers right offhand. Probably fewer than——

Senator BUMPERS. Do you know who they are?

Ambassador COOPER [continuing]. Fewer than—we have some estimates of likely people, and I will provide that in classified——

Senator BUMPERS. Are they friends or enemies? Can you answer that?

Ambassador COOPER. Mixed bag, sir.

Senator **Bumpers**. Mixed bag?

Ambassador **Cooper**. Yes, sir.

GOAL OF GPALS

Senator **Bumpers**. Finally, you stated that GPALS needs to stop all—virtually all—of 200 incoming RV's. What is virtually all? What percentage is that?

Ambassador **Cooper**. Well, we are studying that to try to understand how demanding is reasonable—the tradeoff between demanding perfection and good enough is measured, perhaps, in this case in whether you are talking—I do not know—98-percent confidence, 95-percent confidence, some set of numbers. But the objective is to get a very high probability that we would destroy all of a launch, for example, of submarine-launched missiles from a single submarine or out of a single—what we would call a squadron of missiles in the United States, that is a unit, the smallest unit under the control of a single officer.

TIMBER WIND

Senator **Bumpers**. Mr. Chairman, I do have one other question that I thought would have been asked earlier this morning, but if it was I did not see it.

Now, Mr. Ambassador, the United States has a policy that we have submitted to the United Nations earlier this year. And it says, "Nuclear reactors should not be made critical during or after launch until they have reached their operating orbit or interplanetary trajectory." Are you familiar with that?

Ambassador **Cooper**. Yes, sir.

Senator **Bumpers**. We are getting down to the Timber Wind Program. Is all that classified?

Ambassador **Cooper**. I would be happy to discuss that subject with you in an appropriate place, sir. As a matter of policy, we have taken the position that we would neither confirm nor deny the press reports on Timber Wind in public.

Senator **Bumpers**. Could you assure the committee—and let me ask you, Mr. Chairman, if this would be classified. Could you assure the committee that we are not going to violate that policy? This is our policy.

Senator **Inouye**. You had better do it privately.

Ambassador **Cooper**. I would prefer to speak to you privately, sir. I would say that this, as well as all of our programs, are under appropriate supervision by the Congress.

SOVIET AIR DEFENSE CAPABILITIES

Senator **Bumpers**. If I could just make one final observation, and that is when you consider that a German pilot can fly a Piper Cub into the Kremlin yard, and a Cuban Mig has to circle for 30 minutes waiting to get in and still wasn't detected, you wonder what we are spending all this money for. I mean, you consider the mammoth amount of money the Soviet Union has spent on air defenses.

Ambassador **Cooper**. Yes, sir.

Senator BUMPERS. And I assume that our air defenses are fairly good, at least in the Florida area. And when you see those things happening you wonder just how effective all of this is.

Ambassador COOPER. Well, I would just note that Saddam Hussein used missiles. Mu'ammar Qadafi has the distinction of being the first to fire missiles at the West, and he did that in 1986. And then he fell short of Italy.

I believe that these weapons systems which are, in fact, proliferating throughout the world are sort of a way to a place at a table that is very important to these Third World countries. And second, they potentially hold at risk, in a terrorist sense, populations around the world that there is no stopping them at this stage. Airplanes—even the argument about folks bringing it in on a barge and so on, those are real threats I think we have to worry about as well. I see no reason why we should leave this one unchallenged, though.

Senator BUMPERS. In other words, the fact that somebody can plant one possibly in a suitcase in the Statue of Liberty or that the Russians have bombers where they could fire cruise missiles—maybe 1,000, 1,500 miles off shore, or even maybe penetrate our air defenses and drop gravity bombs—the fact that all of this money we are going to spend does not affect any of that, and therefore, does not affect the safety of our populations——

Ambassador COOPER. I want to be careful about one point. And that is that if we are dealing—I want to make sure that you understand that it is my judgment if we are going to deal with the accidental or unauthorized launch from submarines in particular and the submarine-launched ballistic missile—the Red October threat, I think we have to deal with it whether it is ballistic missiles or cruise missiles. So I do not want to be illogical. You know that I would take as a point of illogic to say you are going to deal with it with ballistic missiles but somehow cruise missiles go free.

I would note there is a big difference between a missile that can strike you in a few minutes and one that takes considerably longer, which is a difference between a cruise missile and a ballistic missile.

And I would note that we do, in fact, have defenses against aircraft and cruise missiles and so on. And perhaps that was one of the reasons that Hussein used the Scud. The other is he had to get across Jordan to get at his prime target. And he was, I have to remind you, trying to provoke retaliation. It was defense that gave us another option. I believe the Patriot was really a strategic importance. It was not the role that it had in the battle. It was the fact that it helped up keep the coalition together that history will write about.

And I believe to deny ourselves of a defensive option in all of these contexts is just short sighted. If we can do it. In the past, technically there were real challenges and problems that stood in the way of getting the job done. I believe that the technology today will support the development of a serious defense. And I think under these circumstances it would be a mistake not to give ourselves that alternative.

PATRIOT AS JUSTIFICATION FOR SDI

Senator **Bumpers**. Do you agree with Harold Brown, who said to use the Patriot as a justification for SDI, anybody who says that does not know what they are talking about?

Ambassador **Cooper**. I do not use Patriot as a justification for SDI. And I have claimed from the beginning no credit for Patriot. It was developed outside of our offices, but I will say that I think it made some pretty important points and I think destroyed some myths that have been widely propagated as a part of the debate over defenses. And in that sense it will certainly help us, I believe.

Senator **Bumpers**. Mr. Chairman, thank you very much.

SELLING SDI

Senator **Inouye**. I thank you, sir.

Mr. Ambassador, experience suggests that about 90 percent of the decisions made by the subcommittee will be adopted and accepted by the full Senate with very little debate, if any. In fact, we may not have votes on it. About 5 percent would involve objections based upon parochial interests and such. The remaining 5 percent are items of great controversy involving the full Senate. Oftentimes, these matters of controversy become so because of the lack of information, and I think SDI is in that category.

I want to make certain that the administration has every opportunity to, as Senator Cochran pointed out, sell the program. With all respect, I must say that the selling job is difficult, but you make it a bit more difficult. For example, we look at that chart there, GPALS—I doubt if three members of this subcommittee will be able to explain to anyone what E^2I is—that endo/exoatmospheric interceptor.

Ambassador **Cooper**. Yes, sir.

Senator **Inouye**. Or that THAAD is theater high-altitude area defense or TMDGBR is the theater missile defense ground base radar or what P^3I means, Patriot preplanned product improvement.

What I am trying to point out is that a decision is going to be made by 100 Senators, most of the Members of this body will be voting with very little understanding of what we are voting on. So I would suggest that while time is still available—although we would want to have our full committee markup by mid-July it would appear that is not quite possible, so it may be sometime in September—that you prepare a brochure of sorts covering items that you are well aware that concern us such as the ABM Treaty and what narrow and broad interpretations mean. Some of these systems that you have pointed out in the GPALS cost estimates—why you think it would be cheaper or more expensive.

Now, all of these questions should be of concern to all of us, but the administration's presentation I must say, respectfully, has opened itself to simplified assault. So I would like to invite you to present something that most Members can understand—read and understand—and I will make that part of the record.

Ambassador **Cooper**. All right, I would be pleased to do that.

Senator INOUYE. Because if they read your testimony and looked over this sheet, I would be surprised if 10 Members of the Senate would know what this is all about.

SDI REPORT

Ambassador COOPER. I would hope, Senator, by the time we get to your markup in July, we have the report to Congress in your hands which will lay out in much more detail what these programs elements are, as well as the policy, starting with our national policy and defense policy and how we are implementing it. I regret we do not have it yet.

Senator INOUYE. If you would present that in language that most, if not all, of us can understand, I think it would help immensely, even explaining the charts here.

You have a very important assignment, a very important responsibility. I want to make certain that the decision I make is the proper one. I do not wish to wake up 10 years from now and say to myself, Oops, I made the wrong one. Many of my colleagues may have to face that, and I am trying to make it possible so that we can come up with an intelligent decisionmaking process here. This will be one of the biggest issues.

We have the B–2 issue also and that may hold up the markup process for a while because the authorization committee may have problems on that.

So in the time that you have I would suggest very strongly that you come forth with something like that.

Ambassador COOPER. We will do that, sir.

Senator INOUYE. With that, I thank you very much for your participation this morning. It has been helpful to me.

ADDITIONAL COMMITTEE QUESTIONS

[CLERK'S NOTE.—Additional questions submitted by subcommittee members, together with the Department's responses, will appear in the appendix portion of the hearings.]

SUBCOMMITTEE RECESS

Senator INOUYE. This subcommittee will recess until tomorrow at 11 a.m. in this room. At that time we will have witnesses from the Navy and the Congressional Budget Office to discuss the future of naval aviation in wake of the cancellation of the A–12 program.

[Whereupon, at 12:35 p.m., Tuesday, May 7, the subcommittee was recessed, to reconvene at 11 a.m., Wednesday, May 8.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1992

WEDNESDAY, MAY 8, 1991

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 11:03 a.m., in room SD–192, Dirksen Senate Office Building, Hon. Daniel K. Inouye (chairman) presiding.

Present: Senators Inouye, D'Amato, and Specter.

Also present: Senator Bond.

CONGRESSIONAL BUDGET OFFICE

NATIONAL SECURITY DIVISION

STATEMENT OF ROBERT F. HALE, ASSISTANT DIRECTOR, NATIONAL SECURITY DIVISION

ACCOMPANIED BY MICHAEL BERGER, NAVY ANALYST, NATIONAL SECURITY DIVISION

OPENING STATEMENT OF SENATOR INOUYE

Senator INOUYE. Since World War II, naval aviation has played a critical role in our Nation's defense, both in maintaining deterrence and waging war. On countless occasions, the country has called on naval air power to protect its interests throughout the globe and its importance is an accepted fact.

Yet, if the fiscal year 1992 budget request is a measure of the need for naval aviation, perhaps we have begun to take this linchpin for granted. Last year the Congress provided funds to remanufacture 12 F–14D aircraft, conduct research on the Navy ATF, and buy 66 F/A–18's.

Congress recognized that delays in the Navy's A–12 program reduced their requirement for production funding in fiscal year 1991. Still, this committee, and ultimately the Congress, supported the development and production of the A–12 program because of the urgent need to replace the aging A–6.

Clearly, the Congress endorsed a robust naval aviation program even while reducing the total DOD budget by more than $19 billion. Considering this support by Congress, the status of naval aviation in the President's original budget submission for fiscal year 1992 was disturbing. The President proposed canceling F–14D remanufacturing, terminating the A–12, ending the Navy's involvement in the advanced tactical fighter program, and reducing procurement of the F/A–18 aircraft.

In short, the backbone of naval aviation—its fighters and attack aircraft programs—were virtually decimated both for today and for the future. The budget proposal was so devastating that the administration has reconsidered its plans and has proposed an amendment to resuscitate its naval aviation program.

In its review today, the subcommittee will hear from the Navy about the specific details of the proposed amendment and how this new plan will address the shortcomings of the original budget submission within tight budget constraints.

The centerpiece of the new plan is the replacement for the A–12, the A–X. While the Secretary of Defense canceled the A–12 program in January because of uncertainty of its total cost, it is only now that the subcommittee can seriously evaluate the Secretary's decision by examining what has been proposed as an alternative.

The budget amendment offers one plan to restore naval aviation. In addition to reviewing the amendment, the subcommittee has requested that the Congressional Budget Office examine Navy aviation requirements and discuss several other possible alternatives to broaden the debate on the future of naval fighter and attack assets.

Furthermore, the committee hopes to clarify the record of what went wrong with the A–12 program, not to assess blame but to better understand how to avoid similar occurrences in the future.

So, to aid us in our review this morning, the subcommittee is pleased to welcome Bob Hale, Assistant Director of the Congressional Budget Office for the National Security Division; Mr. Gerald Cann, the Assistant Secretary of the Navy for Research, Development and Acquisition, and Vice Adm. R.M. Dunleavy, the Assistant Chief of Naval Operations for Air Warfare. We will begin this morning's testimony with Mr. Hale.

Mr. Hale.

Mr. HALE. Thank you, Mr. Chairman, for the opportunity to testify. I have with me Mr. Michael Berger, who prepared CBO's testimony. I have a prepared statement for the record and I will provide an oral summary.

Senator INOUYE. Your complete statement is made part of the record, sir.

SUMMARY STATEMENT

Mr. HALE. The administration recently submitted to the Congress a revised plan for naval aviation. As you said, it reflects cancellation of the A–12. CBO's assessment suggests that, unless there are substantial increases in funding or further cutbacks in numbers of forces, the revised plan would eventually meet less than 60 percent of the Navy's long-term requirements for fighter and attack aircraft.

FOUR ALTERNATIVES

Thus, the Congress may wish to consider alternatives to the administration's proposal. To illustrate the choices that you face, my testimony analyzes the administration's proposal and four alternatives that are defined on the board over here to my left.

PLANES PROCURED AND COSTS OF ALTERNATIVES FROM 1992 THROUGH 1997

Alternative	Planes Procured in 1992-1997	Costs in 1992-1997 (In billions of 1992 dollars)
Administration's Plan		
Develop: AX and F/A-18E/F		
Procure: F/A-18C/D	306	
F/A-18E/F	42	
Total	348	23
Alternative 1		
Develop: A-12 and F/A-18E/F		
Procure: F/A-18C/D	306	
F/A-18E/F	42	
Total	348	23
Alternative 2		
Develop: AX		
Procure: F/A-18C/D	348	17
Alternative 3		
Develop: F-14D Quick Strike and F/A-18E/F		
Procure: F/A-18C/D	252	
F/A-18E/F	42	
F-14D Quick Strike	54	
Total	348	23
Alternative 4		
Develop: F/A-18E/F		
Procure: F/A-18C/D	306	
F/A-18E/F	42	
Total	348	20

These alternatives certainly do not encompass all the options that you could consider. They are an attempt to illustrate the range of choices. Because the focus of the debate is on fighter and attack aircraft, we concentrate on them.

I will first present a very brief description of each of the alternatives that CBO analyzed. I think you are familiar with the administration's plan, which, of course, develops the A–X aircraft and also develops an E/F version of the F/A–18 aircraft, as well as purchasing a number of F/A–18 aircraft.

I might add that, if anyone would find it helpful, my prepared statement briefly summarizes the numerous types of aircraft and also the alphabet soup of designators that I am about to set before you.

As you can see on the board, in constant 1992 dollars, the administration's plan would cost approximately $23 billion between 1992 and 1997. The procurement funds in that $23 billion would buy a total of 348 F/A–18 aircraft, including 306 of the existing C/D version and 42 of the new E/F version. A–X aircraft would be developed between 1992 and 1997, but they would probably not enter production until early in the next decade.

Now, the first alternative that CBO considered would continue development of the A–12 aircraft in an attempt to capitalize on the $3 to $4 billion that the Navy and its contractors have already invested in that plane. Alternative one would build two partial prototype A–12 aircraft, designed to establish cost and capability. If the prototypes were successful, the alternative would purchase the A–12 to meet the Navy's needs for a new, highly stealthy attack plane.

While development of the A–12 continued, this first alternative would buy 348 aircraft, like the administration's plan, and it would also cost about the same as the administration's plan between 1992 and 1997.

The second alternative on the board is designed to help minimize long-term shortfalls of naval aircraft, a subject I am going to come to more in a moment. Like the administration's plan, this second alternative develops the new A–X. However, to hold down costs, alternative two cancels development of the E/F version of the F/A–18. Instead, alternative two buys only the existing C/D version.

Like the administration's plan, and indeed all of the alternatives that I am presenting, this one buys 348 planes between 1992 and 1997. Primarily because it cancels development of the E/F, it is cheaper than the administration's plan, costing only about $17 billion over that 1992 through 1997 period.

Now, rather than developing a new plane with advanced stealth characteristics, the final two alternatives that CBO analyzed would modify an existing plane. Alternative three would modify the F–14D aircraft to what the Grumman Corp. has designated the Quick Strike configuration. The F–14D Quick Strike would have some capability to attack enemy targets either on land or at sea.

This third alternative would also develop the new E/F version of the F/A–18 and buy 348 aircraft of the types that are shown on the board, which would include some of the F–14D Quick Strikes. Alternative three would cost about the same as the administration's plan from 1992 through 1997.

And finally, alternative four would develop only the new E/F version of the F/A–18 and buy 348 of those planes. Thus, under this fourth alternative, the Navy would gradually move toward an all-F/A–18 fleet.

MEETING LONG-TERM NEEDS

Well, having defined the alternatives that CBO considered, I will turn now to the focus of our analysis, which is how well these alternatives would let the Navy meet their numerical requirements for fighter and attack planes through 1998. Either the administration's plans or any of the four alternatives I have just defined should permit the Navy to meet its numerical requirements.

In 1999, however, the Navy would meet only about 92 percent of its expected requirements under all of these approaches. This finding assumes that, in the long run, the Navy continues to operate 13 airwings off carriers and about 20 Marine Corps air squadrons.

While modest shortfalls for fighter and attack aircraft could develop by 1999, those shortfalls could grow sharply in the next decade and beyond. Unless there are increases in funding, CBO estimates that the administration's plan would provide only about 57 percent of the aircraft required to equip 13 carrier airwings and 20 Marine Corps squadrons. You can see that result on the left-hand column there on my board at the top line.

PERCENTAGE OF LONG-TERM REQUIREMENTS MET

Alternative	Planned Unit Costs	Higher Unit Costs
Administration's Plan Develop: AX and F/A-18E/F Procure: AX, F/A-18C/D and E/F	57	42
Alternative 1 Develop: A-12 and F/A-18E/F Procure: A-12, F/A-18C/D and E/F	57	[illegible]
Alternative 2 Develop: AX Procure: AX and F/A-18C/D	72	58
Alternative 3 Develop: F-14D Quick Strike and F/A-18E/F Procure: F-14D Quick Strike, F/A-18C/D and E/F	63	50
Alternative 4 Develop: F/A-18E/F Procure: F/A-18C/D and E/F	67	53

While some of the alternatives in that left-hand column meet a larger percentage of requirements, none meets more than about 72 percent of long-term needs.

Now, these long-term shortfalls of aircraft reflect important assumptions about two factors: how much money will be available and the eventual cost of new and modified planes.

Of course, no one can be sure how much money is going to be available to buy naval fighter and attack aircraft in coming decades. But the numbers in the left-hand column of my board assume a plausible outcome, at least what CBO felt was one. The numbers assume that fighter and attack aircraft receive the same average share of total Navy funding as they received in the post-Vietnam period—1974 through 1990. CBO applied that share to proposed Navy funding in 1995, the final year of the budget agreement.

What each aircraft will cost is another important factor that influences shortfalls. Wherever possible, CBO based its assessment of unit costs on Navy factors, either Navy statements or historical information. If you are interested in our assumptions, they are summarized in my prepared statement.

Based on these and other assumptions, CBO estimated how many aircraft could be purchased by the year 2025—we went way out—under the administration's plan and the four alternatives, and then compared it with requirements. What you are seeing there on the board are the results.

Obviously, few of us who prepared this testimony, or few who are probably listening to it, are going to be worrying about naval aircraft in the year 2025. That is, however, the first year when all the aircraft in the fleet would be of the types that will be determined by the decisions that are before you now.

Moreover, because today's inventory of naval aircraft is getting quite old, the large shortfalls suggested by these long-term calculations are going to be evident well before 2025. They will probably be quite evident in the next decade.

Now, these long-term shortfalls in aircraft are not inevitable, and they could be averted. One way to minimize them or eliminate them is with added money. Depending on the alternative, the shortfalls could be fully eliminated if we increased funding for naval aircraft by between 1.5 and 3 percent a year in real terms in each year beyond 1995.

That may sound like a modest percentage increase, but it would translate into added funding averaging roughly between $1 and $2 billion a year more over the next several decades than the dollars implied by historical shares. It may not be prudent to count on substantial increases in funding in a period of time when threats to U.S. security appear to have declined.

Even if added funding is not forthcoming, the administration could alter other policies to minimize long-term aircraft shortfalls. It could, for example, keep new aircraft in service for more than the 22 years that CBO assumed in this analysis. If aircraft were kept in service for 30 years, then, depending on the alternative, the Navy could meet between 72 and 92 percent of its long-term requirements, still not all, but a lot more.

Unfortunately, while there are assumptions, such as longer service life and more money, that lead to smaller shortfalls, there are also plausible assumptions that lead to larger shortages. For example, the unit costs of these aircraft could go up, something that is quite common in the Department of Defense.

Assume, for the sake of illustration, that procurement prices grow by 25 to 50 percent above their currently planned levels. If such growth in unit cost occurs, then, as the right-hand column of the board there suggests, the Navy would meet only 42 to 58 percent of its requirements, down around one-half.

Moreover, the estimates in this testimony focus on fighter and attack aircraft. But, of course, the Navy buys a lot of other types of planes, ranging from submarine hunters to transport helicopters. Most of these types of aircraft are not in procurement at all right now, so the shortfalls for all types of naval planes could be considerably worse than those that CBO is projecting for fighter and attack aircraft.

OTHER DIFFERENCES IN THE ALTERNATIVES

Well, so far I have concentrated on the main focus of CBO's analysis, how well the administration's plan and CBO's alternatives meet the Navy's numerical requirements. But let me turn now to a brief summary of other differences in the alternatives, including differences in stealth characteristics and other features.

The administration's plan and the first two alternatives in my testimony develop either the A–X or the A–12 aircraft, either of which would be designed to have advanced stealth characteristics. Now, much of the information about the value of stealth is not publicly available. It is clear, however, that the Navy believes that stealth capabilities are very valuable, and the Chief of Naval Operations has made that quite explicit in congressional testimony.

The A–12 aircraft and probably the A–X are also likely to have longer ranges than the F/A–18 or the F–14D, perhaps as much as 1.8 times as long a range in typical strike missions. Longer range would help the Navy accomplish some kinds of missions and it would let the carriers stand off further from shore, making them less vulnerable to enemy attack.

Though the new aircraft developed under the administration's plan in the first two alternatives offer some advantages, the last two alternatives up there, which would modify existing aircraft, also offer some benefits. For one thing, compared with developing new planes, modifying existing aircraft involves substantially less risk of growth in cost or delay in schedule.

Other advantages accrue to specific alternatives. Alternative three, which buys the F–14D Quick Strike, would keep another manufacturer in the business of building new combat planes which, among other things, would add to the ability of the Department of Defense to increase aircraft production quickly in the event of a war.

Alternative four, which buys only the F/A–18, could eventually result in lower operating costs than the other alternatives in my testimony because the Navy would need to buy spare parts and train mechanics and pilots for only one type of aircraft under that approach.

Unfortunately, whatever their advantages, none of the approaches I have discussed, whether the administration's plan or the four alternatives, would permit the Navy to meet its long-term requirements for aircraft without substantial funding increases. Thus, in the long term, these alternatives all present you with a rather unpleasant choice, Mr. Chairman: Either accept a substantial reduction in the number of naval aircraft and, presumably, in the number of carriers, or find a source of substantial added funding.

A SILVER BULLET

Let me conclude by describing a silver-bullet approach that may render the choices you face somewhat more palatable. Under this silver-bullet approach, a new aircraft with advanced stealth capability, presumably the A–X or maybe the A–12, could be developed. If available funds do not increase in future years, then a decision could be made to limit procurement of the A–X or the A–12 aircraft to small numbers.

This approach would provide a few, highly capable aircraft, silver bullets if you will, that could attack the most heavily defended enemy targets.

The board that Michael is putting up now shows the effects of limiting the numbers of highly capable, expensive aircraft to about 10 percent of the fleet, rather than to one-third of the fleet, as the Navy now plans.

PERCENTAGE OF LONG-TERM REQUIREMENTS MET UNDER "SILVER-BULLET" APPROACH

Alternative	Planned Unit Costs	Higher Unit Costs
Administration's Plan Develop: AX and F/A-18E/F Procure: AX, F/A-18C/D and E/F	62	48
Alternative 1 Develop: A-12 and F/A-18E/F Procure: A-12, F/A-18C/D and E/F	62	50
Alternative 2 Develop: AX Procure: AX and F/A-18C/D	87	70
Alternative 3 Develop: F-14D Quick Strike and F/A-18E/F Procure: F-14D Quick Strike, F/A-18C/D and E/F	65	52
Alternative 4 Develop: F/A-18E/F Procure: F/A-18C/D and E/F	67	53

Compared with a fleet with one-third highly capable aircraft, the portion of long-term requirements that are met increases under this silver-bullet approach. However, as you can see in that left-hand column up there, the percentage rises to a high level only if, in addition to limiting the number of highly capable aircraft, the remainder of the fleet is equipped with a relatively low-cost aircraft, like the C/D version of the F/A–18.

Combining a small number of highly capable aircraft with the C/D version of the F/A–18 meets 87 percent of long-term needs. You can see that in alternative two in that left-hand column up there on the board.

Well, would this silver-bullet force, consisting mostly of relatively low-cost aircraft and a few highly capable planes, meet likely future security threats? I think the Navy would probably say "No," both because a relatively low-cost aircraft would not be sufficiently capable, in their view, and because the number of well-defended targets in a future conflict might exceed the small number of highly capable planes that would be available under this option.

However, a silver-bullet force might meet future security threats, particularly if those threats come primarily from countries with smaller military forces rather than from the Soviet Union. The likely outcomes associated with rejecting this silver-bullet approach—namely substantially fewer aircraft carriers or requirements for much larger budgets—may also render the approach attractive.

Well, I have covered a lot of information quickly, Mr. Chairman. I will close by reiterating a key point: unless the administration and the Congress provide substantial increases in funding for naval aviation, a shortfall of naval fighter aircraft is likely to develop around the end of this decade and could grow sharply in later years. To minimize this trend, the Navy could adopt this silver-bullet force, consisting mostly of relatively low-cost aircraft and a few more highly capable planes.

That completes my oral statement, Mr. Chairman. Mr. Berger and I would be glad to answer any questions.

[The statement follows:]

Statement of Robert F. Hale

Thank you, Mr. Chairman, for the opportunity to testify about naval aviation plans. Today, the state of naval aviation is in flux. In recent years, the Administration has terminated five major naval aircraft programs. Most recently, it ended development of the A–12 aircraft at a date too late to permit the budget proposal submitted last February to be revised. The Administration has now submitted a revised proposal designed to reflect the cancellation of the A–12 while also seeking to meet the future needs of naval aviation.

Nor are changes in the Administration's plan the only uncertainty besetting naval aviation. The Administration's revised plan proposes developing an entirely new aircraft along with substantial modification of an existing plane. The costs and capabilities of these aircraft, particularly those associated with the new aircraft, are uncertain. Wherever possible, the Congressional Budget Office (CBO) based the estimates of cost and capability in this testimony on the most recent data available from the Administration. Some of these estimates may change, however, as these aircraft development programs proceed.

This testimony examines a wide range of alternative approaches to meeting the needs of naval aviation. Although the testimony addresses a variety of issues regarding cost and capability, it focuses on affordability—that is, the Administration's ability to meet numerical needs for naval aircraft. Several key conclusions emerge:

—Under the Administration's revised plan, shortfalls of aircraft will develop at the end of this decade and could grow sharply thereafter;

—If the Administration and the Congress do not provide substantial added funding or accept further cuts in forces, the Administration's plan could eventually meet less than 60 percent of long-term requirements for naval fighter and attack aircraft; and

—Creating a "silver-bullet" force consisting mostly of relatively inexpensive aircraft, along with a few planes that have the advanced stealth characteristics that may well be needed to meet future enemy threats, could substantially reduce shortfalls of aircraft.

KEY TYPES OF AIRCRAFT

Because they are the focus of the current debate, this testimony considers only fighter aircraft (which are designed to attack other enemy planes in the air) and attack aircraft (which are designed primarily to attack targets on land and at sea). All of these aircraft are designed to operate from aircraft carriers. Four types of fighter and attack aircraft will play an important role in the debate. The box on page 4 summarizes the characteristics of these aircraft. Readers who do not desire a more detailed description can proceed to the discussion of the Administration's plan on page 8.

F/A–18 AIRCRAFT

The F/A–18 Hornet aircraft seems destined to be the mainstay of naval aviation in future years. This aircraft, which was first procured in 1979, can perform fighter missions as well as attack roles (hence the use of both "F" and "A" in its designation). Today, the Navy is buying the "C/D" version of the F/A–18 aircraft. (The "C" version is a single-seat aircraft, while the "D" version is a two-seat aircraft used for training and, in the Marine Corps, for combat operations.)

Box 1: Aircraft Discussed in this Testimony

Aircraft	Description	Status
F/A-18 Hornet C/D Version	Current version of fighter/attack aircraft manufactured by McDonnell Douglas.	Administration plans procurement through 1997.
F/A-18 Hornet E/F Version	Future version of F/A-18. Major modification of C/D aircraft to provide increased payload and range.	Administration plans $4 billion development program with procurement beginning in 1996.
F-14D Tomcat Quick Strike	Future version of F-14 manufactured by Grumman Corporation. Relatively small modifications required to provide air-to-ground capability to current F-14 model.	Administration proposed terminating all F-14 production in its 1992 budget request.
A-12 Avenger II	Stealth attack aircraft program canceled by the Administration. The A-12 was to replace the aging fleet of A-6E Intruder aircraft currently in the fleet. McDonnell Douglas and General Dynamics were the development contractors.	Administration terminated the program in January 1991.
AX	Successor to the A-12. Navy's new attack aircraft designed to replace current A-6E fleet. No contractors selected.	Administration plans to solicit concept studies within the next several months.

Source: Congressional Budget Office.

The Administration proposes to develop a new "E/F" version of this plane. (The "E" model would be a single-seat aircraft, while the "F" version would be a two-seat aircraft.) The E/F version would be larger than the current C/D version and about 25 percent heavier. The extra size will permit the E/F version to carry a given load of weapons a longer distance, which is important to completing some missions. The longer range would also allow aircraft carriers to operate farther from shore, which reduces threats posed by enemy forces ashore. The E/F version will also feature a more powerful engine. This engine will maintain the speed and maneuverability of the heavier aircraft and so permit the modified plane to engage enemy aircraft even at long distances from an aircraft carrier.

F–14 AIRCRAFT

First procured in 1971, the F–14 Tomcat aircraft has been the Navy's primary fighter for many years. It has been responsible for destroying enemy aircraft at sufficiently long ranges to prevent them from attacking an aircraft carrier. The Navy had begun remanufacturing some F–14 aircraft to a "D" configuration, equipping them with more powerful engines, improved radar and sensors, and new avionics. However, the Administration's latest budget proposed terminating production and remanufacturing of all F–14 aircraft.

The Congress could procure a new model of the F–14 aircraft, which is designed to have the capability to attack enemy targets on land and at sea. (Current models of the F–14 aircraft, including the F–14D, are designed only to attack enemy aircraft.) This testimony discusses a modification of the F–14 that the Grumman Corporation, the F–14 manufacturer, has designated "Quick Strike." The new model would be the least costly of any of the ground attack versions of the F–14D that Grumman proposes. It would provide the F–14D aircraft with the capability to launch bombs and air-to-surface missiles.

A–12 AIRCRAFT

Starring in 1984, the Administration began developing a new attack aircraft. The A–12 aircraft was intended to replace the aging fleet of A–6 attack planes that are now in the Navy's inventory. The A–12 was to have advanced stealth capabilities—that is, it was designed to be difficult to detect with radar or other sensors. It was also supposed to be able to attack targets over 700 miles from an aircraft carrier while carrying a heavy load of munitions. The A–12 aircraft was expected to complete development and enter production around 1992.

During its development, the A–12 program encountered difficulties that led to delays in schedules, increased costs, and uncertainty about the ultimate cost of completing the program. Because of these problems, Secretary of Defense Cheney directed the Navy to terminate the program in January of this year. The A–12, however, could be restarted. A renewed A–12 program might begin with funding to permit completion of two prototype aircraft designed to demonstrate the capability and cost of the A–12 aircraft.

AX AIRCRAFT

When the Secretary terminated the A–12 program, he reaffirmed the need for a new plane to replace the existing fleet of A–6 attack aircraft. To meet this need, the Administration has proposed developing a new plane, designated the AX. Developing the AX aircraft would require about 10 years; the plane would begin entering naval service about the year 2004.

Definite specifications do not exist for the AX aircraft. The specifications would not be fully developed until the Navy solicits and receives conceptual studies from potential manufacturers. At least to some degree, however, the AX would presumably possess the attributes of the canceled A–12—including some of its stealth and long-range capabilities coupled with the ability to carry a substantial load of munitions. The Administration could also possibly seek a plane that has more speed and maneuverability than the A–12 aircraft was designed to possess. That could provide the AX with more capability as a fighter aircraft.

ADMINISTRATION'S APRIL 1991 PLAN

In April, the Administration submitted a revised plan for naval aircraft for 1992 through 1997. The Administration now plans to develop the AX aircraft with its advanced stealth characteristics. The production of that new aircraft would begin shortly after the turn of the century. The Administration's plan also provides added capability in the fighter and attack fleet by developing the E/F version of the F/A–18 aircraft. During the period between 1992 and 1997, the Administration's plan would buy 348 F/A–18 aircraft, including 306 of the C/D version and (in 1996 and 1997) 42 of the new E/F version (see Table 1).

TABLE 1. NUMBER OF AIRCRAFT PURCHASED

	1992	1993	1994	1995	1996	1997	Total
Administration's Plan: Develop AX and Buy Modified F/A-18							
F/A-18C/D	48	48	48	54	54	54	306
F/A-18E/F	0	0	0	0	12	30	42
Total	48	48	48	54	66	84	348
Alternative 1: Develop A-12 and Buy Modified F/A-18							
F/A-18C/D	48	48	48	54	54	54	306
F/A-18E/F	0	0	0	0	12	30	42
Total	48	48	48	54	66	84	348
Alternative 2: Develop AX and Buy Current F/A-18							
F/A-18C/D	48	48	48	54	66	84	348
Total	48	48	48	54	66	84	348
Alternative 3: Buy F-14D Quick Strike and Modified F/A-18							
F/A-18C/D	48	48	48	36	36	36	252
F/A-18E/F	0	0	0	0	12	30	42
F-14D Quick Strike	0	0	0	18	18	18	54
Total	48	48	48	54	66	84	348
Alternative 4: Buy Only Modified F/A-18							
F/A18C/D	48	49	48	54	54	54	306
F/A-18E/F	0	0	0	0	12	30	42
Total	48	48	48	54	66	84	348

SOURCE: Congressional Budget Office.

Over the next six years, the Administration's plan would cost approximately $23 billion (see Table 2). (Unless otherwise noted, all costs in this testimony are expressed in 1992 dollars of budget authority.) About $16 billion of that amount would pay for procurement of F/A–18 aircraft. Another $4 billion would pay for developing the new E/F version of the F/A–18 plane. The remaining $3 billion would pay for the initial development costs of the AX aircraft which, according to press reports, could eventually total $11 billion.

TABLE 2. COSTS OF ALTERNATIVES FROM 1992 THROUGH 1997
(In billions of 1992 dollars)

	Development	Procurement	Total
Administration's Plan: Develop AX and Buy Modified F/A-18			
Develop AX	3	n.a.	3
Develop F/A-18E/F	4	n.a.	4
Procure F/A-18	a	16	16
Total	7	16	23
Alternative 1: Develop A-12 and Buy Modified F/A-18			
Develop A-12	4	n.a.	4
Develop F/A-18E/F	4	n.a.	4
Procure F/A-18	a	16	16
Total	7	16	23
Alternative 2: Develop AX and Buy Current F/A-18			
Develop AX	3	n.a.	3
Procure F/A-18C/D	a	13	13
Total	3	13	17
Alternative 3: Buy F-14D Quick Strike and Modified F/A-18			
Develop F-14D Quick Strike	a	n.a.	a
Develop F/A-18E/F	4	n.a.	4
Procure F-14 Quick Strike	n.a.	5	5
Procure F/A-18	a	14	14
Total	4	19	23
Alternative 4: Buy Only Modified F/A-18			
Develop F/A-18E/F	4	n.a.	4
Procure F/A-18	a	16	16
Total	4	16	20

SOURCE: Congressional Budget Office.

NOTES: Totals may not add due to rounding.
n.a. = not applicable.

a. Less than 0.5 billion.

The Administration's current plan would cost substantially more than the proposal for naval fighter and attack aircraft that the Administration submitted as part of its February 1991 budget. That proposal would have required funding of about $14 billion in 1992 through 1997. The Administration had to reduce funding in other areas of the Defense Department's budget to ensure that the current plan, which purchases more naval fighter and attack aircraft than the February 1991 plan, would not result in defense spending that exceeds the limits established in the

Budget Enforcement Act of 1990. The current plan reallocates funds from different parts of the defense budget, including funds that would have been used for the canceled A–12 program.

ALTERNATIVE APPROACHES TO MEETING AIRCRAFT REQUIREMENTS

To illustrate the wide range of choices facing naval aviation, this testimony discusses four alternatives to the Administration's plan that purchase different combinations of the key types of aircraft discussed on pages three through eight. Each alternative purchases a total of 348 aircraft during the period from 1992 through 1997, the number that the Administration requests in its current plan.

The alternatives vary in cost. But they vary most notably in their approach to the key decision facing naval aviation: whether to develop a new attack aircraft that would be expensive but would incorporate advanced "stealth" characteristics that minimize the chance of detection by enemy sensors. The first two alternatives assume development of an aircraft with advanced stealth characteristics; the last two alternatives rely on improvements to existing aircraft.

ALTERNATIVE 1: DEVELOP A–12 AND BUY MODIFIED F/A–18

The first alternative, like the Administration's plan, would develop the E/F version of the F/A–18 aircraft and would buy 348 F/A–18 aircraft. It would also develop a new aircraft with advanced stealth characteristics. Instead of developing the AX aircraft, however, this alternative would continue to develop the A–12 aircraft in hopes of capitalizing on the $3 billion to $4 billion that the Navy and its contractors have already invested in this aircraft.

Specifically, this alternative would provide research funding for a three-year program to develop and flight test two partial prototypes of the A–12 aircraft. One prototype would be developed to test advanced electronics and avionics systems. The other prototype would be used to study the aircraft's flight characteristics, structural soundness, and detectability by radar and other sensors. Lessons learned during the flight test program should help resolve uncertainty about the A–12 aircraft itself. Moreover, even if the A–12 program were not pursued, the testing might reduce the risks in subsequent efforts to build advanced naval combat aircraft with stealth characteristics.

Alter the three-year program, the Administration could decide whether to resume full-scale development of the A–12 aircraft. This alternative assumes that, following the end of prototype testing, the Administration embarks on a full-scale development effort and production.

After Secretary Cheney terminated the A–12 program in January 1991, the Administration and the A–12 contractors disagreed about the terms under which the original contract was canceled. Both sides are preparing arguments for impending litigation. This alternative assumes that the legal dispute between the government and the contractors would not prevent the Administration from continuing the A–12 program.

Costs for this alternative total about $23 billion between 1992 and 1997, including about $4 billion to pay for further development of the A–12 aircraft. Between 1992 and 1997, this alternative would cost about the same as the Administration's plan, which begins development of the new AX aircraft. It is not clear, however, that the costs for A–12 and AX programs would be equal over the longer term. Before canceling the program, estimates of the total cost to develop the A–12 aircraft ranged from $8.4 billion to $17.4 billion. Press reports suggest that the Administration expects development of the AX aircraft to cost about $11 billion, within the range of the expected costs to develop the A–12 aircraft. However, it is too early to know with confidence which program—the AX or the A–12—would be cheaper to develop over the long term because of the significant uncertainties surrounding both efforts.

ALTERNATIVE 2: DEVELOP AX AND BUY CURRENT F/A–18

Like the Administration's plan, this alternative begins development of an AX aircraft. However, in an attempt to hold down costs both in the near term and the longer run, this second alternative does not develop the new E/F version of the F/A–18 aircraft. All F/A–18 purchases would be of the C/D version.

During the 1992–1997 period, Alternative 2 would cost about $17 billion, about $6 billion less than the Administration's plan. Costs are lower primarily because Alternative 2 avoids spending the $4 billion in development costs for the E/F version of the F/A–18 aircraft. This alternative would also help minimize long-term shortfalls of aircraft, a looming problem that is discussed more fully later in this testimony.

ALTERNATIVE 3: BUY F–14D QUICK STRIKE AND MODIFIED F/A–18

Alternative 3 differs sharply from the first two alternatives because it relies on modifications to existing aircraft rather than developing a new plane with advanced stealth characteristics. Alternative 3 would develop neither the AX nor the A–12 aircraft. Instead, the Administration would develop and procure the Quick Strike version of the F–14D aircraft. The F–14D Quick Strike aircraft is designed to have some capability to attack targets on land and at sea. Beginning in 1995, this alternative assumes the purchase of 18 new F–14D Quick Strike aircraft each year. In addition, Alternative 3 would develop and procure the E/F version of the F/A–18. CBO estimates that costs under this alternative would total about $23 billion from 1992 through 1997.

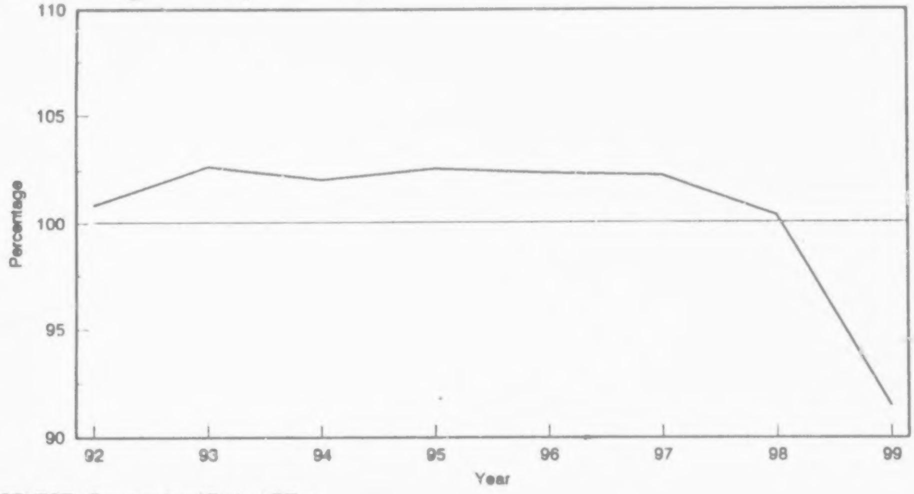
ALTERNATIVE 4: BUY ONLY MODIFIED F/A–18

Alternative 4 represents the most far-reaching departure from the Administration's plan and the first two alternatives. Alternative 4 would develop the E/F version of the F/A–18 aircraft but would cancel all other development programs for naval fighter and attack aircraft. Thus, this alternative would buy only F/A–18 aircraft. Costs for this alternative would be about $20 billion from 1992 through 1997.

ABILITY TO MEET NUMERICAL REQUIREMENTS IN THE 1990'S

The Administration's plan and the four alternatives that I have just defined should all permit the Navy to meet its numerical requirements for fighter and attack aircraft through 1998. In 1999, however, the Navy would meet only about 92 percent of its expected requirements for aircraft (see Figure 1).

Figure 1.
Inventory of Fighter and Attack Aircraft as a Percentage of Requirements

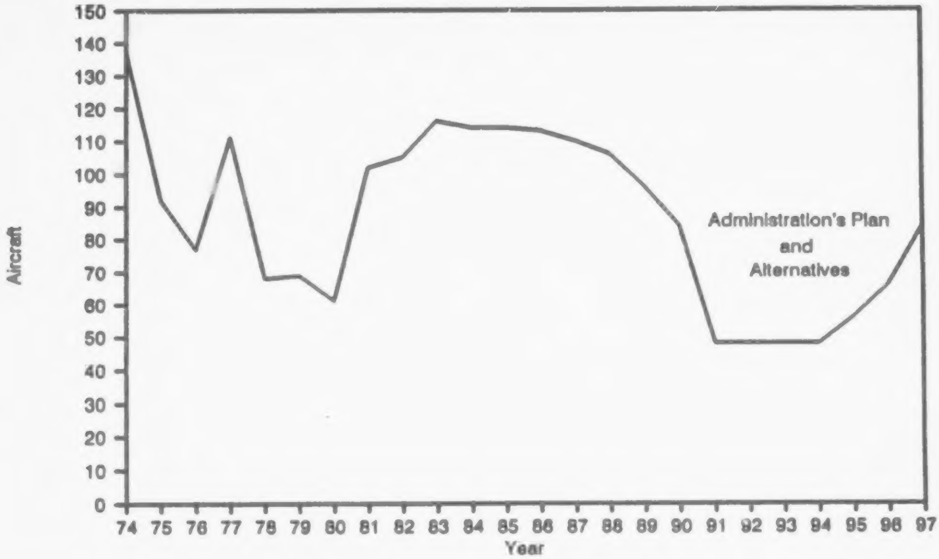


SOURCE: Congressional Budget Office.

NOTE: Results assume that 348 planes are purchased from 1992 through 1997 and that the Navy operates 13 air wings.

Two factors contribute to the shortfall of aircraft that develops in 1999. First, the Administration's plan and the alternatives buy an average of 58 fighter and attack aircraft a year through 1997, a small number by historical standards. Between 1974 and 1990, for example, the Navy bought an average of 99 fighter and attack aircraft each year. (Figure 2 shows the number of fighter and attack aircraft that the Navy purchased from 1974 to 1990.) Second, the Administration currently plans to retire a significant number of naval aircraft late in the 1990s and early in the next century. Aircraft life is limited by the number of flight hours that airframes will withstand before fatigue threatens flight safety. Many aircraft will reach the limit of their fatigue life shortly after 1998. The Navy could change policies in ways that minimize or avoid shortfalls of aircraft. For example, the Navy is currently studying the feasibility and cost of modifications designed to extend the service lives of existing aircraft.

Figure 2. Fighter and Attack Aircraft Procurement, 1974 to 1997



SOURCE: Congressional Budget Office.

NOTE: Data for 1977 include aircraft funded in the transitional quarter that followed the 1976 fiscal year.

CBO reached its conclusions about aircraft shortfalls by comparing the Navy's projected inventory of fighter and attack aircraft with our estimates of the Navy's requirements for these aircraft. CBO assumes that the Navy continues to operate 13 air wings designed to fly off aircraft carriers, which is consistent with the number of aircraft carriers that the Navy plans to operate throughout the decade. (See Tables A–2 and A–3 in the Appendix to this testimony for details about these assumptions.) Navy aircraft requirements also include fighter and attack aircraft operated by the Marine Corps.

ABILITY TO MEET NUMERICAL REQUIREMENTS IN THE LONG TERM

While the Administration's plan and the four alternatives in this testimony are likely to result in modest shortfalls for fighter and attack aircraft by 1999, they could result in much larger shortfalls in the longer term. Unless the Administration and the Congress elect to provide substantial increases in funding, the Administration's plan would meet only about 57 percent of the Navy's long-term requirements, assuming that those requirements remain constant at their planned 1998 level (see Table 3). The four alternatives would meet only between 57 percent and 72 percent of the Navy's long-term requirements. The first alternative, which combines development of the AX or A–12 aircraft with purchase of the new E/F version of the F/A–18, meets the smallest percentage of long-term requirements. The second alternative, which develops the AX aircraft but not the new E/F version of the F/A–18, meets the largest percentage. The other alternatives fall in between.

TABLE 3. PERCENTAGE OF AIRCRAFT REQUIREMENTS MET UNDER ALTERNATIVES IN LONG TERM

Alternative	Planned Unit Costs	Higher Unit Costs[a]
Administration's Plan: Develop AX and Buy Modified F/A-18	57	42
Alternative 1: Develop A-12 and Buy Modified F/A-18	57	46
Alternative 2: Develop AX and Buy Current F/A-18	72	58
Alternative 3: Buy F-14D Quick Strike and Modified F/A-18	63	50
Alternative 4: Buy Only Modified F/A-18	67	53

SOURCE: Congressional Budget Office.

NOTE: Numbers apply to the year 2025. Estimates assume that AX, A-12, or F-14D compose one-third of the airwing requirements of carriers for fighter and attack aircraft. Estimates assume that F/A-18s compose two-thirds of carrier airwing requirements and all other requirements for fighter and attack aircraft. Estimates also assume that aircraft retire after 22 years and that requirements remain constant at their 1998 level, which includes 11 active and 2 reserve airwings.

[a] Higher costs for all aircraft except the AX are 25 percent higher than planned costs. AX costs are 50 percent higher than planned costs. All costs used for the estimates are listed in Table A-1 in the Appendix.

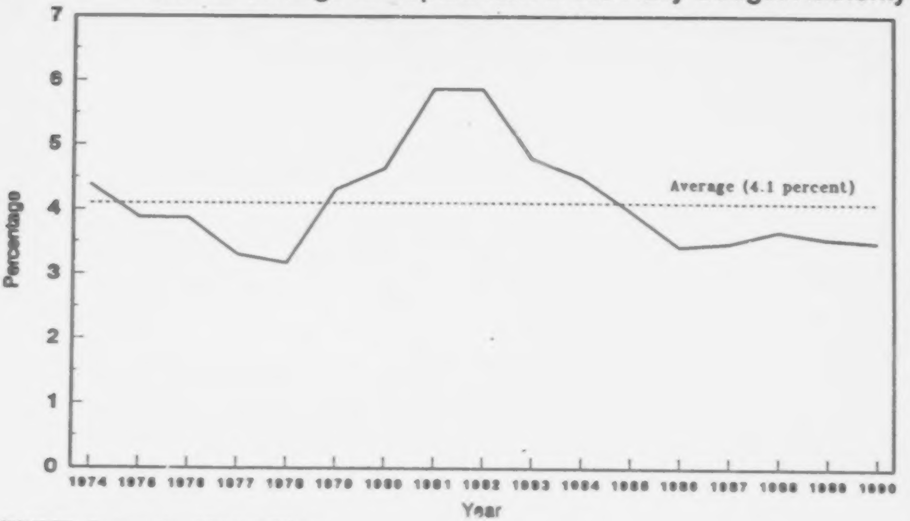
ASSUMPTIONS UNDERLYING LONG-TERM ESTIMATES

These long-term estimates depend most critically on two factors: the availability of funds and the eventual cost of new and modified aircraft.

Availability of funds.—How much funding might be available for naval fighter and attack aircraft in the latter part of the 1990s and in the next century? Of course, no one can know for sure. To illustrate one plausible outcome, CBO assumed that fighter and attack aircraft receive the same average share of total Navy funding as they have received during the post-Vietnam period (1974 through 1990). CBO applied that share to the Department of Defense's estimate of total Navy funding in 1995, the year when all the budget reductions imposed by the Budget Enforcement Act of 1990 have been carried out. Under these assumptions, about $3.5 billion would be available each year to buy fighter and attack aircraft for the Navy.

This assumed level of funding is substantially higher than the $2.4 billion in funds for these type of aircraft proposed in the Administration's current budget request for 1992, or the $1.9 billion proposed for 1993. The post-Vietnam share of funding that is assumed to be available for fighter and attack aircraft (4.1 percent) is also higher than the share these types of aircraft received during the latter part of the 1980s (see Figure 3).

Figure 3. Fighter and Attack Aircraft Procurement Budget Authority As a Percentage of Department of the Navy Budget Authority



SOURCE: Congressional Budget Office.

Note: Data for 1977 include aircraft funded in the transitional quarter that followed the 1976 fiscal year.

Costs of aircraft.—Wherever possible, CBO based its assumptions about the prices of aircraft on either Navy data or historical information. CBO assumed that the E/F version of the F/A–18 aircraft and the F–14D aircraft could be procured at prices that are consistent with recent Navy estimates. Prices for today's C/D version of the F/A–18 aircraft are based on actual costs in Navy budgets. CBO estimated the procurement costs for the A–12 aircraft from estimates prepared by the Department of Defense before the program was canceled. Costs for the AX aircraft, whose specifications have not yet been developed, are assumed to be equal to those for the A–12 aircraft. (Table A–1 in the Appendix to this testimony specifies the detailed assumptions about aircraft costs.)

Other assumptions.—CBO also made other assumptions that are important to this analysis of long-term trends. The analysis assumes that new aircraft remain in service for a period of 22 years. The Administration has not publicly stated a goal for the service life of new naval aircraft. The assumption of 22 years is based on a planning factor used by the Air Force, whose aircraft generally operate in a less stressful environment than the one experienced by aircraft based on carriers. CBO also assumed that about 2 percent of operating naval aircraft are lost each year as a result of peacetime accidents.

The analysis assumes that about two-thirds of the numerical requirements for fighter and attack aircraft in aircraft carrier air wings are met with F/A–18 aircraft; the remaining one-third is met with the other types of aircraft procured under the Administration's plan and the alternatives (AX, A–12, F–14D Quick Strike or, in the case of Alternative 4, more F/A–18 aircraft). Finally, the Navy has numerical requirements for fighter and attack aircraft for purposes other than aircraft carrier air wings, including Marine Corps units. In analyzing each alternative, CBO assumed that these other requirements would be filled by F/A–18 aircraft.

Defining "long term".—Based on these assumptions, CBO estimated how many aircraft could be purchased by the year 2025 under the Administration's plan and the alternatives in this testimony. We then compared this estimate with requirements, which are assumed to remain constant with requirements in 1998.

Obviously, few who prepared this testimony, or who are listening to it, will be worrying about naval aircraft in the year 2025. The year 2025 is, however, the first year when all aircraft in the fleet would be of the types specified by the Administration's plan and the alternatives. A long-term calculation also has another advantage: it avoids the need to account in detail for plans that govern retirement of existing aircraft.

Moreover, the problems suggested by this long-term calculation may well be here much sooner than the year 2025. Much of today's inventory of naval aircraft is getting old, and the large shortfalls suggested by the long-term calculation may be quite evident by the end of the next decade.

EFFECTS OF INCREASED FUNDING

Shortfalls could be minimized or eliminated with added funds. The estimates in Table 3 on page 21 assume that funding for fighter and attack aircraft remains constant in real terms at about $3.5 billion a year, a level consistent with historical shares and the planned 1995 level of the total Navy budget. Depending on the alternative, the shortfalls associated with current prices could be fully eliminated if funding for fighter and attack aircraft grows by between 1.5 percent and 3 percent a year in each year beyond 1995. These rates of growth are roughly consistent with long-terms rates of growth in the U.S. gross national product (GNP). Thus, if the Administration and the Congress elect to provide naval aviation with funding increases that parallel past growth in GNP, aircraft shortfalls could be avoided.

Growth of 1.5 percent to 3 percent a year would, however, translate into added funding averaging between $0.9 billion and $2.2 billion a year over the next several decades. It may not be prudent to count on substantial added funding in a period when many threats to U.S. security appear to have declined. Indeed, if threats continue to decline and lead to further real declines in defense spending, shortfalls could be much larger than those projected in this testimony.

EFFECTS OF ALTERING OTHER KEY ASSUMPTIONS

Even if added funding is not forthcoming, the Administration could alter other policies in ways that minimize aircraft shortfalls. It could, for example, keep new aircraft in service for more than 22 years. If naval aircraft were retained in the fleet for 30 years, then depending on the type of planes bought, the Navy could meet between 72 percent and 92 percent of its long-term requirements. Retaining aircraft for 30 years might, however, lead to problems. Some types of existing fighter and attack aircraft, including the A–6 attack aircraft now in service, may remain in the fleet for more than 30 years. But the A–6 fleet has experienced problems—such as wing cracks that limit certain types of stressful flight activities—that are associated with its venerable age.

The Administration could also elect to reduce requirements for fighter and attack aircraft, and hence shortfalls, by equipping each aircraft carrier with fewer aircraft. Clearly, however, the capability of the Navy's aircraft carriers would be reduced under such a policy.

While some factors could lessen these shortfalls, others could increase them. For example, the unit costs of new and modified aircraft could rise. Cost growth in defense weapon programs is quite common. Assume, for the sake of illustration, that procurement prices grow by 25 percent above their currently expected level for all aircraft considered in this testimony (except for the AX aircraft, which is assumed to grow by about half because it is less well defined and because it will be in development for a longer period than any of the other aircraft). If this growth in cost occurs, then the Navy would be able to meet between 42 percent and 58 percent of total requirements for fighter and attack aircraft (see Table 3 on page 21).

Moreover, the estimates in this testimony focus on fighter and attack aircraft. But the Navy buys and operates many other types of aircraft, including planes that hunt submarines either from land bases or from aircraft carriers (P–3 and S–3), Marine Corps attack jets (AV–8B), transport and attack helicopters (CH–46, CH–53, and AH–1), early warning aircraft (E–2C), and electronic warfare aircraft (EA–6B). Although some of these aircraft types will be retired over the next decade, the Navy is not now budgeting for their replacements. Leaving aside fighter and attack aircraft, the Administration's plan requests the purchase of an average of only about two fixed wing combat aircraft a year between 1992 and 1997, which amounts to less than 1 percent of the 1995 requirements for these types of aircraft. Obviously, many more aircraft will be required in the future, and the new types of aircraft that will be designed to carry out the various other missions are likely to cost more than existing aircraft. The combination of higher prices and the low level of planned funding suggests that shortfalls for all types of naval aircraft might be as bad or worse than those for fighter and attack planes.

SUMMARY OF DIFFERENCES AMONG ALTERNATIVES

The alternatives in this testimony differ in their effect on the Navy's ability to meet its numerical needs for aircraft. The alternatives also differ in their emphasis on developing new types of aircraft designed to have advanced stealth capability, as well as in other features that have important implications for overall capability.

DEVELOPING NEW STEALTH AIRCRAFT

The Administration's plan and the first two alternatives in this testimony develop either the AX or the A–12 aircraft. Because they assume the purchase of new planes, these alternatives would provide more stealth capability than would be true for the alternatives that modify existing aircraft. To have a high degree of stealth, an aircraft must have a shape and other design features that minimize its visibility to radars and other detectors. While engineers could probably modify existing aircraft such as the F/A–18 or the F–14 to reduce their radar and other signatures, constraints that the shape of these aircraft impose would almost certainly render them more detectable than a newly designed plane.

The greater degree of stealth likely to be associated with the AX or A–12 aircraft could be important to naval aviation in future years. The Soviet Union may continue to improve its radar along with its other sensors and weapons, thus posing an increasing threat to U.S. aircraft in any future conflict with that country. Even if the Soviet Union decreases the pace of its modernization, other nations may deploy highly capable sensors and weapons that would make aircraft with stealth capability desirable for some military missions.

How valuable is the contribution of stealth to the ability of aircraft to survive enemy defenses? Much of the information regarding the advantages of stealth aircraft is highly classified and not available to CBO. The Navy clearly believes, however, that stealth capabilities are very valuable. The Chief of Naval Operations recently testified before the Congress that stealth would "significantly improve the odds of survival for our aircrews and increase their ability to successfully complete their mission." According to the Chief, recent computer simulations of Middle East combat scenarios show that nonstealth aircraft were lost to enemy attack at rates that were at least six times greater than those for stealth aircraft.

The Air Force also claims that stealth contributed to the success of its fleet of F–117 fighters during the recent war against Iraq. According to the Air Force, stealth fighters accounted for 3 percent of Air Force aircraft in the Persian Gulf region, but destroyed about 40 percent of all strategic targets attacked by coalition air forces. The Air Force also asserts that none of the stealth fighters deployed to the Gulf was hit by enemy fire, even though they routinely attacked targets that were heavily defended.

Nor would stealth capability be the only advantage offered by the A–12 and probably the AX aircraft. Compared with existing aircraft, both the AX and A–12 aircraft would probably be able to attack targets that are farther from the aircraft carrier. This longer range would permit the carriers to remain farther from shore where they are less vulnerable to attacks by enemy aircraft, submarines, missiles, patrol boats, or mines. Aircraft with longer ranges could also attack targets that are located farther inland. Alternatively, longer-range aircraft could spend more time searching for hard-to-find targets, such as mobile missile launchers. Finally, if necessary to accomplish a particular mission, longer-range aircraft could sacrifice some of their range and carry a larger payload of weapons.

Data supplied by the Navy show that, when operating on a typical strike mission, the A–12 aircraft could attack from a carrier located about 1.8 times farther away from its target than could an E/F version of the F/A–18 or an F–14D aircraft. (This estimate assumes that both the F/A–18E and the F–14D use external fuel tanks. Figure A–1 in the Appendix shows the details supporting these results, while Figures A–2 and A–3 show results in scenarios other than a strike mission.) The operating range of the AX aircraft will not be known until the specifications of the aircraft have been developed. However, the AX is likely to have an advantage in range compared with the F/A–18 and F–14 aircraft, though perhaps not as great an advantage as the A–12 aircraft.

While the advanced stealth characteristics and greater range of the aircraft purchased under the Administration's plan and the first two alternatives offer clear advantages, the options also require that an entirely new aircraft be developed or, in the case of the A–12, complete the development process. Developing new aircraft entails risks that all desired performance characteristics will not be achieved and that costs will grow above planned levels.

Moreover, the A–12 and AX aircraft would be expensive. Thus, the Administration's plan and the first alternative, which combine development and purchase of either the AX or the A–12 aircraft with procurement of the E/F version of the F/A–18 aircraft, would permit the Administration to meet only about 57 percent of Navy's long-term requirements for fighter and attack aircraft in the absence of funding increases. Alternative 2, which develops the AX aircraft but continues to buy the current C/D version of the F/A-18 aircraft, meets a larger share of the Navy's needs. But that alternative still only meets 72 percent of total requirements.

RELIANCE ON EXISTING AIRCRAFT

To resolve at least some of these problems, the Congress could adopt one of either of the final two alternatives in this testimony. These approaches forgo developing a new aircraft with advanced stealth characteristics and rely instead on modified versions of existing aircraft.

The Administration could, for example, develop the Quick Strike version of the F-14D aircraft in order to provide the fighter capability long associated with the F-14 plane as well as some ability to attack targets on land and at sea. Purchase of the F-14D Quick Strike aircraft could be coupled with development and procurement of the E/F version of the F/A-18 aircraft. Alternatively, the Administration could rely entirely on the E/F version of the F/A-18 aircraft.

Compared with approaches that develop an entirely new aircraft, alternatives involving the F-14 Quick Strike aircraft or the E/F version of the F/A-18 aircraft would pose substantially less risk that costs would grow or that schedules would be delayed. Modifying current models of the F/A-18 aircraft to the E/F configuration would require finishing the development of a new engine, lengthening the plane's fuselage by 34 inches, and increasing the area of the wings by 25 percent. The changes that would be necessary to develop the F-14D Quick Strike are considerably less than those required to create an E/F version of the F/A-18 aircraft. Both changes are substantially less risky than developing a new aircraft, whether an A-12 or an AX.

Buying the F-14D Quick Strike would also keep another aircraft manufacturer (the Grumman Corporation) in the business of building new combat aircraft. Maintaining another producer might contribute to an excess of capacity to produce aircraft in peacetime. But an extra producer might also enhance peacetime competition and should add to the ability of the Department of Defense to increase aircraft production quickly in the event of a large war.

Operating costs might also be reduced if the Administration decided to rely solely on the F/A-18 aircraft. A fleet composed entirely of F/A-18 aircraft would probably cost less to operate than fleets associated with other approaches because the Navy would need to buy spare parts and train mechanics and pilots for only one type of aircraft.

Reliance on existing aircraft would not, however, permit the Administration to buy enough aircraft to meet its long-term requirements for naval aircraft without increases in procurement funding. In the long term, alternatives that rely on the modified version of the F/A-18 aircraft, or the F-14D Quick Strike aircraft, meet only about 65 percent of total requirements.

Relying on existing aircraft could also result in a less capable fleet. Today's A-6E attack aircraft can operate in all types of weather. Neither the F-14D Quick Strike aircraft nor the E/F version of the F/A-18 aircraft would include radar that would permit the aircraft to operate close to the ground during periods of poor visibility. Adding that capability would require additional expense.

More important, because of its basic shape and design, neither the F-14D aircraft nor the F/A-18 aircraft are likely to have the advanced stealth characteristics that would be part of a new aircraft such as the A-12 or, presumably, the AX. This limitation could be especially important if enemy threats to naval fighter and attack aircraft increase, either threats from the Soviet Union or from other nations that improve their capability to detect aircraft.

THE DILEMMA: FEWER CARRIERS OR MORE FUNDS

The Administration's plan and the alternatives in this testimony span a wide range of choices. But neither the Administration's plan nor any of the alternatives permit the Navy to meet its long-term requirements for aircraft without funding increases. Building a new aircraft with advanced stealth characteristics, which may well be necessary to counter future enemy threats, could increase long-term shortfalls.

Thus, in the long term, the Administration faces a set of rather unpalatable choices. It can accept a substantial reduction in the number of naval aircraft and, presumably, in the number of aircraft carriers. But if not, the Administration must identify a source of substantial increases in funds for naval aviation.

SILVER-BULLET APPROACH

To minimize the shortfalls in aircraft or the need for added funding, the Administration could consider a major change in the composition of aircraft carried aboard aircraft carriers of the future. A new aircraft with advanced stealth capability, either an A–12 or an AX aircraft, could be developed. If available funds do not increase in future years, then a decision could be made to limit procurement of the AX or the A–12 aircraft to small numbers. This would provide a few, highly capable aircraft—silver bullets—that could attack the most heavily defended enemy targets.

The portion of long-term requirements that are met would increase substantially, however, only if the remainder of this silver-bullet fleet is equipped with a relatively low-cost aircraft. Assume, for example, that the expensive AX aircraft makes up only 10 percent of the fighter and attack aircraft in air wings of the future, compared with 33 percent that might be AX aircraft under current policies. The remainder of the fleet would consist of the existing C/D version of the F/A–18 aircraft. Even if funding does not increase above levels implied by historical shares, this approach would permit the Administration to meet about 87 percent of its total requirements for fighter and attack aircraft (see Table 4). Looked at another way, the average real increase in funding required to meet all requirements under this approach would be only about 0.7 percent a year compared with increases of between 1.5 percent and 3 percent under alternatives that do not reflect the silver-bullet approach. (These estimates reflect the increases in unit cost of the AX aircraft that are likely to occur if only a small number of the aircraft are purchased.)

TABLE 4. PERCENTAGE OF AIRCRAFT REQUIREMENTS MET UNDER ALTERNATIVES IN THE LONG TERM ASSUMING SILVER-BULLET FORCES

Alternatives	Current Unit Costs	Higher Unit Costs[a]
Administration's Plan: Develop AX and Buy Modified F/A-18E/F	62	48
Alternative 1: Develop A-12 and Buy Modified F/A-18	62	50
Alternative 2: Develop AX and Buy Current F/A-18	87	70
Alternative 3: Buy F-14D Quick Strike and Modified F/A-18	65	52
Alternative 4: Buy Only Modified F/A-18	67	53

SOURCE: Congressional Budget Office.

NOTE: Numbers apply to the year 2025. Estimates assume that AX, A-12, or F-14D compose 10 percent of the airwing requirements of carriers for fighter and attack aircraft. Estimates assume that F/A-18s compose 90 percent of requirements for carrier airwing and all other requirements for fighter and attack aircraft. Estimates also assume that aircraft retire after 22 years and that requirements remain constant at their 1998 level, which includes 11 active and 2 reserve airwings.

a. Higher costs for all aircraft except the AX are 25 percent higher than planned costs. AX costs are 50 percent higher than planned costs. All costs used for the estimates are listed in Table A-1 in the Appendix.

If the Administration or the Congress wanted to embark on this silver-bullet approach, they could adopt Alternative 2 in this testimony. That alternative continues development of a new aircraft—either the AX or the A–12—with advanced stealth characteristics. The alternative also cancels plans to develop the E/F version of the F/A–18 aircraft in favor of continued purchases of the existing C/D version of the F/A–18, a relatively low-cost plane.

Would a silver-bullet force consisting mostly of relatively low-cost aircraft, coupled with only a few highly capable aircraft, meet future security requirements? The Navy would probably say no, both because a relatively low-cost aircraft would not be sufficiently capable, in their view, and because the number of well-defended targets in a future conflict might exceed the small number of highly capable aircraft that would be available under this option. A silver-bullet force might, however, meet future threats to U.S. security, particularly if those threats are created primarily by the relatively small military forces of countries other than the Soviet Union. The capabilities of naval aircraft could be enhanced by increasing the use of advanced munitions, such as the cruise missiles that were used successfully in the Persian

Gulf war. The likely outcomes associated with rejecting this silver-bullet approach—substantially fewer aircraft carriers or requirements for much larger budgets—may also render the approach attractive.

CONCLUSION

Unless the Administration and the Congress provide substantial increases in funding for naval aviation, a shortfall of naval fighter and attack aircraft is likely to begin at the end of the 1990s and could grow sharply in later years. Long-run shortfalls occur in part because a new attack aircraft with advanced stealth characteristics and other improved capabilities, which may well be needed to meet security threats of the future, is likely to be quite expensive. The trend toward large shortfalls and sharply smaller forces could be averted at least partially by a silver-bullet force consisting mostly of relatively low-cost aircraft along with a small number of the most capable planes.

APPENDIX TABLES AND FIGURES

TABLE A-1. ESTIMATES OF LONG-TERM COSTS USED IN THIS TESTIMONY (In billions of 1992 dollars)

Aircraft	Planned Unit Costs	Higher Unit Costs
Procurement Unit Costs Used for Table 3		
F/A-18C/D	40	50
F/A-18E/F	60	75
F-14D Quick Strike	75	95
A-12	105	130
AX	105	160
Procurement Unit Costs Used for Table 4		
F/A-18C/D	40	50
F/A-18E/F	60	75
F-14D Quick Strike	85	105
A-12	125	155
AX	125	190

SOURCE: Congressional Budget Office.

NOTE: Higher unit costs are 25 percent higher than planned costs, except for the AX. Higher AX costs are 50 percent higher than planned costs.

TABLE A-2. NUMBER OF AIRCRAFT PER AIRCRAFT CARRIER AIR WING

	Type of Air Wing		
Type of Aircraft	Conventional	Roosevelt	Transitional
Fighter (F-14)	24	20	20
Strike/Fighter (F/A-18)	24	20	20
Attack (A-6; A-X; A-12)	14	20	16
ASW (S-3)	6	6	6
Electronic Warfare (EA-6)	4	5	5
Early Warning (E-2)	4	5	5
ASW/Helo (SH-3, -60; HH-60)	6	8	8
Total	82	84	80

SOURCE: Congressional Budget Office based on Department of the Navy data.

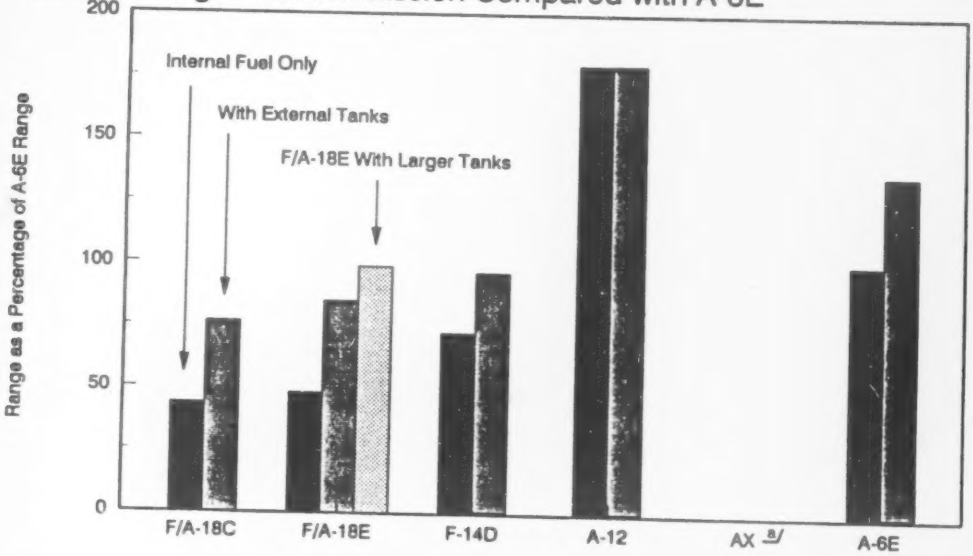
TABLE A-3. AIRCRAFT CARRIER AIR WINGS BY YEAR

Type of Wing	1992	1993	1994	1995	1996	1997	1998 and Subsequent Years
Conventional	2	0	0	0	0	0	0
Roosevelt	1	1	1	1	1	1	2
Transitional	8	10	10	10	10	10	9
Reserve	2	2	2[a]	2	2	2	2

SOURCE: Congressional Budget Office based on Department of the Navy data.

[a] Reserve air wings change from modified Conventional to modified Transitional in 1994.

Figure A-1.
Relative Range in Strike Mission Compared with A-6E

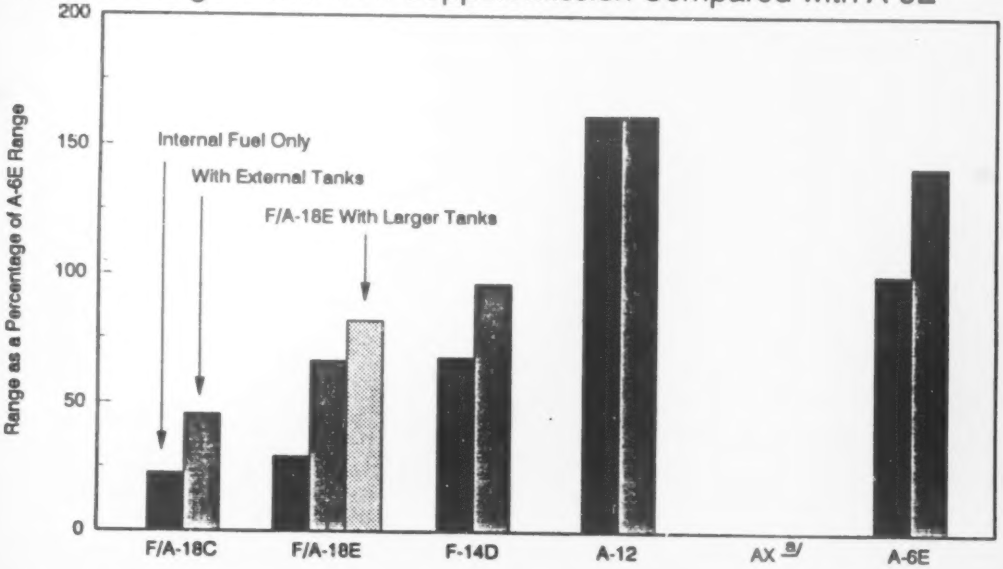


SOURCE: Congressional Budget Office based on Department of the Navy data.

NOTE: A-6E aircraft using only internal fuel equals 100 percent.

a. Range requirements for the AX have not been determined.

Figure A-2.
Relative Range in Close Air Support Mission Compared with A-6E

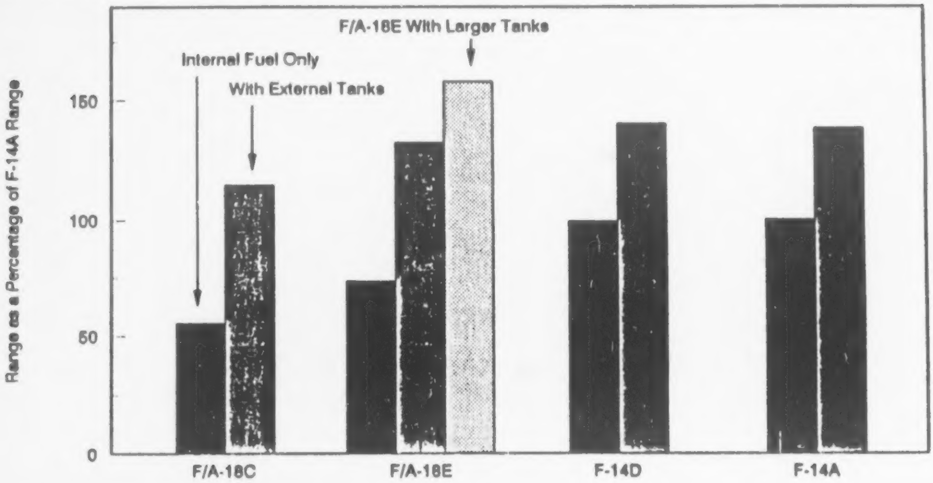


SOURCE: Congressional Budget Office based on Department of the Navy data.

NOTE: A-6E aircraft using only internal fuel equals 100 percent.

a. Range requirements for the AX have not been determined.

Figure A-3.
Relative Range in Combat Air Patrol Mission Compared with F-14A



SOURCE: Congressional Budget Office from Department of Navy data.

NOTE: F-14A aircraft using only internal fuel equals 100 percent.

Senator INOUYE. Thank you very much, Mr. Hale.

Understandably, CBO's primary focus and orientation would be cost and affordability, and when one considers the real world with budget constraints it begins to sound ominous. But in all of the alternatives you have indicated that the Navy cannot afford them; is that correct?

BUDGET CONSTRAINTS

Mr. HALE. That is probably too strong a term. I mean, they have got a $90 billion budget. They could give up other things. But, if the historical share of funding for fighters and attack aircraft stays constant, that is right, they could not.

Senator INOUYE. You even suggested the alternatives might include cutting down the carrier fleet, is that right?

Mr. HALE. Presumably, if the Navy ends up with many fewer aircraft, there will be a move to do that.

Senator INOUYE. How confident are you with the cost estimates? I realize it is an estimate.

Mr. HALE. They are indeed. That is a point well taken.

Unfortunately, cost estimates do not tend to go down. So I would feel that the cost estimates in my testimony tend to be at the lower end of the likely range.

What CBO has done to arrive at cost estimates is to go back to Navy documents, usually the selected acquisition reports, and extrapolate costs. In some cases, we have had to go back a year, say, to get the costs for the F–14D Quick Strike. We extrapolated from the current SAR to get costs for the E/F version of the F/A–18. We have had some informal discussions with the Navy about the costs of the E/F version. They have raised concerns. I think they hope to get the F/A–18E/F version for less money than that SAR seems to us to imply.

But my own feeling, having watched this for 20 years or so, is that these costs do not tend to go down. I would fear, if anything, they will go up.

Senator INOUYE. Since last year, the Navy has canceled the ATF, the A–12, and the 14–D. The only new aircraft is the A–X. With your background, do you think it makes any sense that this A–X should have multimission capabilities in order to replace all of these programs that I listed?

Mr. HALE. Well, I think I would like to leave it to the Navy to decide on whether they need multimission capability. But I sure would say, if they choose to try to make the A–X into both a fighter and an attack aircraft—and history is a guide—it will be very expensive, probably a good deal more than they are hoping for now.

I think the expected unit procurement costs of the A–X is on the order of $100 million now, the flyaway cost perhaps something more like $65 million, or at least that is my understanding of where the Navy thinks it is going.

The history of multimission planes, like the F–111, is not reassuring with regard to costs. So from a standpoint of these concerns about meeting long-term requirements, I would hope that the Navy would seriously consider focusing on either an attack or a fighter capability for the A–X aircraft.

Senator INOUYE. How did you estimate the cost of the A–X? We still do not have a picture of the A–X.

COST OF THE A–X

Mr. HALE. Right; excellent point. CBO assumed it was equal in cost to the A–12, and we are very explicit about this assumption in the testimony, saying that we do not know what it is going to cost. I think no one will know until the requirements are made more specific.

I understand that in testimony yesterday, I think it was Admiral Dunleavy who said that the flyaway cost of the A–X would be on the order of $65 million, which would probably translate into a unit procurement cost—when you add in initial spares and ground support equipment—on the order of $100 million. And that is roughly what we are assuming.

So I do not think we are too far off today's best guess. But I assume the Navy would agree that until they have a firmer notion of what the A–X plane is going to look like, costs are quite uncertain.

Senator INOUYE. On the silver bullet, I suppose you are suggesting something like the F–117?

Mr. HALE. What we had in mind there was limiting the numbers of, say, A–X. If you went with the administration's plan now, it will be 10 to 15 years before you are going to have to make procurement decisions, especially about total procurement.

So if the funds were not available and you developed the plane, the idea of the silver bullet is that you would sharply reduce the numbers that you planned to buy. Rather than one-third of the fleet being A–X, it might be more like 10 percent. And you would have then—maybe that is your point, Mr. Chairman—you would have a fleet that is, in a way, analogous to the F–117 fleet in the

Air Force. It would presumably be used against the most highly defended targets.

The silver-bullet approach is a way of trying to afford a larger fleet. It is not a panacea. You are going to have more of a relatively cheaper and presumably less capable plane. But that may be both budgetarily appropriate and, maybe, it will meet security needs. If the United States is going primarily against smaller countries, perhaps that will meet security requirements.

Senator INOUYE. Well, I thank you very much, Mr. Hale. We called upon CBO to assist us because we wanted to carry on some sort of debate as to the costs and the estimates involved. Well, you have given us several alternatives. We will study them very carefully.

Before we call on the next witness, it is my pleasure to call upon Senator Bond.

Senator BOND. Thank you very much, Mr. Chairman, and I sincerely appreciate the courtesy you and the ranking member, Senator Stevens, have accorded me by allowing me to sit in on this hearing.

Not only do I have a very great personal interest in the work of this subcommittee, the people of my State are very much interested in it. I welcome the opportunity to learn from these witnesses what is the state of the debate in this area. I have no questions for this witness.

Thank you, sir.

Senator INOUYE. Thank you very much, Mr. Hale.

Mr. HALE. Thank you, Mr. Chairman.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE NAVY

OFFICE OF THE ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

STATEMENT OF HON. GERALD A. CANN, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

ACCOMPANIED BY: VICE ADM. RICHARD DUNLEAVY, U.S. NAVY, ASSISTANT CHIEF OF NAVAL OPERATIONS FOR AIR WARFARE

INTRODUCTORY REMARKS OF SENATOR INOUYE

Senator INOUYE. It is my pleasure now to call upon the Assistant Secretary of the Navy for Research, Development, and Acquisition, the Honorable Gerald A. Cann, and Vice Adm. R.M. Dunleavy, the Assistant Chief of Naval Operations for Air Warfare.

Mr. Secretary and Admiral, it is always good to see you, sir.

Mr. CANN. Thank you, sir.

Senator INOUYE. Mr. Secretary.

Mr. CANN. Thank you very much, Mr. Chairman and distinguished members of the subcommittee. As you have noted, I have brought with me Vice Adm. Richard Dunleavy, Assistant Chief of Naval Operations for Air Warfare.

Senator INOUYE. You have brought a good man along, sir.

Mr. CANN. Before I begin my statement and with the subcommittee's permission, I think it would be very beneficial to allow Admiral Dunleavy to put the naval aviation requirements issues in perspective. So before I proceed with my comments, I would like to give him an opportunity to set in place for you our naval aviation requirements and where we think we are going.

Senator INOUYE. Admiral.

Admiral DUNLEAVY. Good afternoon, Mr. Chairman, and thank you very much. It is always good to be here, especially with you as the chairman. And distinguished members of the subcommittee, thank you for inviting us here today to testify on the A–12 follow-on and the Navy's modernization requirements.

MODERNIZATION PLAN FOR NAVAL AVIATION

Before we address the future of naval aviation in today's testimony, I would like to provide you with a brief perspective of the modernization plan for naval aviation and some background that will, hopefully, clarify how we arrived at these objectives.

Over the last decade the United States has made a major investment in its military posture, not least in its Navy. That investment has paid invaluable dividends, most recently with the highly successful liberation of Kuwait.

However, during this past year we have witnessed other dramatic changes in the world order that are having a major impact on our naval force structure and naval aviation. The challenge before us now is to preserve our defense investment at a time of great global uncertainty and declining budget, and to do so in a way that makes both fiscal and military sense.

The fiscal year 1992 budget represents a significant reduction in naval aviation force structure and a major loss of programmed replacement aircraft. Aircraft carriers will be reduced from 15 to 13, carrier airwings would be reduced from 13 Active and 2 Reserve wings to 11 Active and 2 Reserve wings by the end of fiscal year 1993. Maritime patrol aircraft squadrons, the P–3's, will be reduced from 24 Active and 13 Reserve aircraft squadrons to 18 Active and 9 Reserve.

The A–12, the P–7, the advanced tactical surveillance aircraft, the Navy ATF, and the F–14D programs have all been canceled. Naval aviation is clearly confronted with a modernization crisis. We have had to completely revise our modernization plan.

The new plan is reflected in the amended budget submission that you have recently received. In essence, it was decided that we should transition our current carrier airwing, fighter-attack aircraft mix of 20 F–14's, 20 F/A–18's, and 16 A–6's to an airwing of 40 stretched F/A–18's and 20 A–X aircraft.

We feel this airwing is an achievable objective within the projected fiscal constraints, will meet warfighting requirements, and should retain our technology edge.

NEW AIRWING FORCE STRUCTURE

Mr. Chairman, the carrier airwing is a primary force of naval power projection. Its composition has been the focus of considerable study and intense debate during the recent months. I feel it is important that I share with you the logic that has guided us to our new airwing force structure.

As we planned for the future, it became clear that our national security strategy would likely shift from containing the Soviet Union to maintaining regional stability. This evolving strategy will continue to place high demands on our carrier battle groups in a turbulent multipolar world.

Naval aviation is faced with a declining budget and aircraft retirements as we approach the year 2000. It is vital we buy enough aircraft to fill our carrier decks, yet our old modernization plan is clearly unaffordable. We are faced with the choice of lowering the cost of our airwing or cutting more force structure below 13 carriers.

We have had to make some painful decisions, extremely painful. Our highest priority is the procurement of a survivable, all-weather, long-range attack aircraft to replace our aging A–6. Third World air-to-air and surface-to-air threats are becoming increasingly sophisticated and lethal. Modifications of our current aircraft are not acceptable solutions.

We need the survivability and all-weather, deep interdiction capability of the A–X aircraft. Our most cost effective interim fix is to improve the A–6 with new wings and modest upgrades until the A–X IOC's in the 2003 to 2005 timeframe.

NATF is unaffordable at forecast budget levels. Our next challenge is to decide how do we modernize the F–14 and the F/A–18. Separate upgrades or replacements for both these aircraft are just cost prohibitive. It would have required additional force structure cuts.

The Soviet anticarrier strike is the most challenging antiair warfare threat to the aircraft carrier. It is not likely we will face this scenario in the foreseeable future.

The stretched F/A–18 has about the same range as the F–14D; with the AAAM missile it can meet the warfighting requirements for AAW, antiair warfare, with acceptable risk. The F/A–18 is a more effective attack aircraft than the F–14D in that it is more accurate, it has more advanced weapon system features, has a night attack capability, has a greater range of weapons it can carry, and has less vulnerable area. In addition, the F/A–18 can generate more sorties, is safer, requires fewer personnel, and is cheaper to operate.

Replacing both the F–14 and the F/A–18 with the F/A–18E/F offers major cost savings. The F/A–18E/F is cheaper than the F–14D on an aircraft to aircraft basis. This neckdown requires less total R&D than pursuing both upgrades. It yields one efficient production line vice two inefficient production lines. It lowers support and infrastructure costs. It lowers operating costs and personnel costs.

Necking down to the F/A–18E/F is the most logical and cost-effective solution to satisfy the F–14 and F/A–18 mission requirements, so we chose this course and decided to build toward a 2010 notional airwing of about 40 F/A–18E/F's and 20 A–X aircraft.

As we transition to this new airwing, we will be forced to accept a temporary drawdown in medium attack aircraft until the A–X arrives. For this reason, it is important that we increase the F/A–18 procurement now to keep our carrier decks full in the outyears.

Mr. Chairman, our plan to modernize the carrier airwing will allow the Navy to achieve a balanced naval aviation force structure, meet warfighting requirements, and maintain 12 carrier battle groups. The continued support of Congress in protecting our investment in naval aviation will ensure our success as we bring this plan to fruition.

Mr. Chairman, I would like to turn the mike over to Mr. Cann at this time.

Senator INOUYE. Thank you very much, Admiral.

Mr. Secretary.

Mr. CANN. Thank you very much, Mr. Chairman.

I have a few comments I would like to make before we get into the questions and, with your concurrence, I have a statement for the record.

Senator INOUYE. It will be made part of the record, sir.

SUMMARY STATEMENT OF MR. CANN

Mr. CANN. My statement explains my acquisition philosophy and provides an overview of the extensive organizational changes I have made since my confirmation just over a year ago. The statement also includes a summary of key aviation programs.

As Admiral Dunleavy indicated, modernizing our naval aviation assets is essential if we are to maintain the versatility, quick response, and flexibility that are the hallmarks of our country's naval aviation program.

DESERT STORM EXPERIENCE

As you will recall, in the early days of Desert Shield the first major power projection force to arrive was the *Independence* Battle Group, which was within strike range of the Iraqi forces on August 6 and ready to engage. Three days later the *Eisenhower* Battle Group arrived in the Red Sea and was ready to strike Iraqi targets.

The ability for Navy aircraft carriers with their embarked airwing to go in harm's way at a moment's notice and conduct sustained power projection operations has never been matched by any other deployable asset.

FISCAL YEAR 1992 BUDGET REQUEST

Admiral Dunleavy has described where we stand in the naval aviation modernization plan. The Navy's fiscal year 1992 budget submission, together with the amendment to the President's budget, presents a program that takes into account individual program status, the changing world situation, fleet needs, and budget realities.

This modernization program is achievable and necessary to ensure that naval aviation does not enter a tailspin shortly after the turn of the century, when replacement aircraft will be needed.

The amended budget submission was forwarded to the Congress April 26 of this year. With respect to the changes proposed in fiscal years 1992 and 1993, it is requested that these provisions be considered as part of the fiscal year 1992–93 appropriations approval process.

Changes have also been proposed involving realignment of the 1990 and 1991 funds. Since it is important that some of these efforts commence as soon as possible, congressional approval of the fiscal year 1990–91 funding revisions is requested prior to the summer recess.

A–X PROGRAM

Turning to the A–X program, the A–X program will design and develop the next generation all-weather medium attack aircraft. The budget amendment includes provisions that will support a concept-exploration phase for the A–X beginning in fiscal year 1992. This would lead to an engineering and manufacturing development phase in fiscal year 1997 and production commencing in fiscal year 2002.

Currently, the operational requirement for a long-range, all-weather, night-capable, survivable, medium attack, carrier-capable naval system is undergoing a complete review. We are studying the full range of alternatives for this medium attack replacement system.

We are going into the A–X with our eyes open. The lessons learned from the A–12 cancellation will be incorporated in the A–X program from the beginning.

The other major program in the modernization effort is the F/A–18E/F upgrade. This stretched version of the F/A–18 will provide the additional range and payload needed to maintain the F/A–18's effectiveness and growth potential into the next century.

The F/A–18E/F supports both Navy and Marine Corps requirements with a proven force multiplier capable of close air support, air superiority, fighter escort, and interdiction.

Congressional support for the naval aviation programs is well appreciated. It is clear that continued congressional support will be needed to carry on the work necessary to maintain our naval aviation assets and our Nation's naval power projection capabilities into the next century.

With that, Mr. Chairman, we are prepared now to answer your questions.

[The statement follows:]

STATEMENT OF GERALD A. CANN

As the Navy Acquisition Executive, I am responsible to the Secretary of the Navy for all acquisition matters including research, development, systems and platform production, shipbuilding and associated support programs. My primary function is to provide acquisition policy, procedures and oversight of the administration of all Navy research, development and acquisition programs. Following the validation of a fleet requirement by Joint Requirements Oversight Council (JROC), the Chief of Naval Operations or the Commandant of the Marine Corps, and after appropriate programming and budgeting of resources, responsibility for transitioning the requirement into a piece of functioning hardware ready for operational test and evaluation and fleet introduction falls within my purview. My goal is to ensure that all programs are well run, technically feasible and adequately funded.

Maintaining and modernizing our Naval Aviation assets continues to be an important part of the Navy acquisition program. During the past year several problems, most notably termination of the A–12, have adversely impacted our long term modernization plans. The Navy's FY 1992 budget submission, together with the amendment to the President's Budget, presents a program that takes into account individual program status, the changing world situation, fleet needs and budget realities.

The A–12 program was terminated in January 1991 due to failure of the contractor to perform to the contract requirements. The decision to terminate the A–12 was made when it became clear that the magnitude of schedule and technical risk had become unacceptable. The schedule for the first flight had slipped two years from June 1990 to sometime between March and September of 1992. This schedule delay was primarily the result of redesign due to weight growth and manufacturing problems associated with the use of high performance composite materials. Other areas that were identified as entailing technical challenge included software development, ESM system development, multi-function antenna performance and auxiliary power unit incompatibility with aircraft carrier operations. Additionally, estimates of the ultimate cost to complete the A–12 full scale engineering development contract varied, but were well above the contract's ceiling price of 4.8 billion dollars.

The requirement to replace the medium attack capability embodied in the A–6 and similar in capability to the cancelled A–12 program still exists. The budget amendment provides for near and longer term programs to address these requirements. It is important that our Navy maintain it's mission essential power projection capabilities during the time it will take for a deliberate, well structured acquisition program to design, develop and produce a replacement for the A–6.

To bridge the development gap and ensure a continuous medium attack all weather capability we need to modify the A–6 aircraft to keep it viable into the next century. As the necessary first step we plan to rewing an additional 120 A–6E aircraft with composite wings. The President's Budget requested funds for 60 rewings and the Amended Budget Request requests 60 more. This will remove the flight restrictions on these aircraft and allow us to take full advantage of their remaining service life. The A–6E will also receive survivability improvements. Planned modifications include the A–6 System/Weapon Integration Program (SWIP) upgrades. These upgrades will improve standoff range with HARM, HARPOON, Infrared/Laser Mavericks, Skipper and SLAM weapons systems and improve survivability and reliability with a new computer, Inertial Navigation System (INS), Heads Up Display (HUD), and Integrated Defensive Avionics Program (IDAP). These improvements are necessary to buy the time required to allow a mature development and procurement process for a follow-on system.

The AX program will design and develop the next generation all weather medium attack aircraft. The budget amendment includes provisions that will support a Demonstration/Validation phase for the AX beginning in FY 1992 leading to the engineering and manufacturing development phase in FY 1997 and production in FY 2002. Currently, the operational requirement for a long range, all weather, night capable, survivable medium attack carrier capable naval system is undergoing a complete review. We are studying the full range of alternatives for this medium attack replacement system.

The AX program as currently envisioned includes open competition for concept exploration with award of up to five concept exploration contracts. The program would then downselect before the demonstration and validation phase. Emphasis during this phase would be in risk reduction in manufacturing, materials and propulsion. The requirement for a flying prototype will be included in the demonstration and validation process. We also envision that specifications and requirements should remain evolutionary during this process in order to allow latitude for weight and cost savings tradeoffs to enhance producibility and affordability.

During the engineering and manufacturing development and production phases an integrated master plan relating cost and schedule performance must be in place. A government oversight team in place at contract award to monitor contract performance is an essential element of this effort. Milestones will be event based vice calendar based. Extensive testing and evaluation will be conducted to contain technical risk. Care must be taken to protect the technology and capabilities of this system from unauthorized disclosure while allowing sufficient access to the program to allow proper cost and performance analysis and oversight. We anticipate that only selected technologies and information related to stealth will be classified as special access.

In order to fulfill the multi-mission requirements of attack, fighter escort and short to mid-range intercept we plan to increase production of the C/D model of the F/A-18 dual purpose aircraft to 48 per year in the near term and 54 per year longer term. This higher production is necessary to support carrier airwing force structure requirements. In addition, we will begin development of a major upgrade to the F/A-18. The F/A-18E/F represents a natural evolution of the F/A-18. Acquisition of the F/A-18E/F with its improved range and gross weight capacity is the follow-on and replacement for the F/A-18C/D.

The capability of the F/A-18 has grown over the years with the addition of new and upgraded avionics, sensors and weapons. These improvements have resulted in a night attack capability, multi-sensor integration, a radar upgrade and additional weapons capabilities. With these improvements however, the F/A-18C/D is reaching its weight limits and further growth is not possible without a major structural modification. This new upgrade will provide for acceptable bring-back loads for carrier operations as well as provide the additional range and payload needed to maintain the F/A-18's effectiveness and growth potential into the next century.

Recent reports from DESERT STORM operations on the combat effectiveness, survivability and reliability of the Hornet are impressive. Although the proposed F/A-18E/F is not a replacement for the A-6, it will enhance the strike capability in the carrier air wing, especially in the period between the retirement of the A-6 and the introduction of a follow-on system. The F/A-18E/F supports both Navy and Marine Corps requirements with a proven force multiplier capable of close-air support, air-superiority, fighter escort and interdiction. The amended budget shifts funds in FY 1991, and adds funds in FY 1992 and in FY 1993 for the F/A-18E/F development effort.

Lastly, Congressional support for the Naval aviation programs is well appreciated. It is clear that continued Congressional support will be needed to carry on the work necessary to maintain our Navy's medium attack capabilities into the next century.

Senator INOUYE. Mr. Secretary, Admiral, I should tell you that I have long been a supporter of the Navy. With names like Pearl Harbor and Kaneoye and Barber's Point constantly reminding me of the Navy, anyone from Hawaii is expected to be a supporter of the Navy and naval aviation.

Needless to say, as I indicated in my opening statement, the crisis you find yourselves in disturbs and distresses me very much, and I want to do everything possible to assist you in restoring naval aviation to the level that it should be.

PROBLEMS WITH A–12

We have gone through a very trying period on the A–12, and this committee is not here to assess blame, as I indicated, but to find out what happened, and if there is any way we can avoid similar problems, or whether we can restart the A–12, or does it make sense to do that, having invested about $3 billion so far in 6 years of work.

Mr. Secretary, can you tell us what happened?

Mr. CANN. I think that there are several factors that clearly have come out in the last 8 or 9 months relative to what happened on the A–12 program per se. First of all, there were a number of interesting problems that started this.

There was, in my judgment, a false sense of security because of the fixed-price nature of the contract. The contractors had agreed to develop and build an aircraft for a certain price in a certain amount of time, and the liability of the Government was limited to that amount of money.

I think that some people at the time felt that this was an insurance policy, if you will, that the two largest defense contractors in the country were doing this and they certainly would be able to pull it off.

The immediate question that comes up is, why did we not know about the problems that were in the program until, at least as far as I am concerned, until about June 1 of last year. That came about because of some of the problems that were going on at the contractor level, wherein they began to realize that their weight problems on the A–12 were severe enough to require them to go through what would have to be called a major redesign of some of the wing sections and the main body of the aircraft.

In doing that, to save weight in the composite structures, they took some very large composite box structure components that had about 18 tooling parts for fabrication purposes and they ended up redesigning them, thus ending up with 96 pieces of tooling, instead of 18, for a single piece of the aircraft.

There are four of these large box sections. So there was a lot of change going on at the time that the people who were involved in the management felt that they were getting close to the end of their design phase.

There was a definite lag at the contractor level in getting this information and the impact of this information to their management. From the best I can determine, it was about the March-April timeframe they began to understand the severity of the issue that had been created.

Coupled with that, they were having, or at least one of the contractors was having, poor yield on their composite manufacturing. So there was a compounding of manufacturing problems for the first aircraft that created an environment that allowed the development schedule to get away from them. Their internal management structure made it even more complex, because this was a program with a single contract for a joint venture.

From my point of view, the lack of a single prime contractor was a major problem in terms of getting reliable information out of the project.

Coupled with this, I think there was a tendency on the part of Navy management to believe as things started to come to the fore that we would be able to work out solutions and get back onto schedule. I think it was not really until June 1, which is the first time I heard about this, when the key people from the two corporations walked in my office and we really began to understand the severity of the problem.

Of course, at that point I undertook to complete a critical design review to find out exactly where we were at the time. By the end of October we had completed an audit of the entire program. We knew to a large extent where all the problems lay, except that as we pressed on and, at the time of termination of this program, we were still in a position where it was uncertain when the first flight would be. The yield of some of the composite members was still not completely settled and the overall cost of the development to the contractor was still not completely understood.

It should be pointed out that the liability to the Government was fixed at a certain price.

That is a very short synopsis of what I think are some of the factors that led to the problems with the A–12.

LESSONS LEARNED

Senator INOUYE. Having gone through this distressing episode, are you sufficiently confident that you will be able to avoid similar difficulties in bringing about the A–X?

Mr. CANN. I am very confident, because we are going to operate from a completely different set of ground rules. First of all, any new program we move into will not have a fixed price development program. There will be no concurrent fixed-price production options that are schedule driven.

The entire concept of the A–X is what I would call an event-based process, where before we take one step we finish the step before. I would like to make sure that we reduce the risks in the program during the dem-val phase, or demonstration-validation phase.

My intention is to have our program manager go out and get up to five concept formulation studies, where we do extensive tradeoffs to make sure that we understand what the capabilities could be, or would be, and get proposals from different people. Getting those proposals, I would hope that we would be able to maximize the carry-through from some of the work that has been done on the ATF program by some of these contractors. We would be able to maximize the use of avionics that have been developed for other purposes, like ATF and so forth, and have a flying demonstration prototype before we enter into full-scale development.

That was one of the problems with the A–12: there was not a flying prototype. So the first FSED aircraft would not fly until after the first production lot had been awarded.

Now, in order to make sure that we do not run into any of the same kinds of problems, instead of having the program manager buried down in the organization, I have made him a direct reporting program manager. He reports directly to me.

In addition to that, I have tried to optimize the use of the cost and schedule review process so that we would have on a monthly basis a clear understanding of essentially what the earned value of the contractor's efforts were, so we would know exactly what he was paid, how much work was accomplished, and whether he was, in fact, falling behind on his planned schedule, so we would be able to work with him more closely.

One of the advantages to a cost-type development contract is it allows the Government to enter into more of a technical partnership with the contractor in terms of making sure that his execution is realistic. It would also allow us to interact with him to resolve problem areas, reduce requirements if we find that it is going to cost too much money to accomplish.

Whereas in a fixed price environment, as you know, we get caught in the trap of, he made a proposal, we gave him a price to complete at those requirements, and therefore he must complete at those requirements unless he gives us some consideration.

So I have spent an enormous amount of time making sure that we have structured a program for the A–X which is going to have, if nothing else, a very low-risk management approach.

Senator D'AMATO. Aha; I did that; aha.

Mr. CANN. Sir?

Senator D'AMATO. I mean, I chuckled.

Senator INOUYE. Keeping in mind that we have invested over $6 billion and 6 years, thousands of hours, man-hours of valuable talent, would it be feasible or sensible to restart the A–12 with the lessons learned?

Mr. CANN. In my judgment, I think it would be very difficult to restart the program at this point. There were some fundamental weight problems that needed to be solved.

I think we have learned some technical things that we do not want to repeat. The A–12 was an extremely stealthy aircraft. In order to maintain its stealth in a 360-degree environment, we insisted that all the ordnance be carried internally. That internal carriage with its required box drove the total weight of the aircraft to a degree that I think most people did not recognize when they started the airplane.

As you know, the projected weight growth at the time of cancellation was about 7,900 pounds. In my judgment, I think that we really need to do some things differently.

In the case of the A–X, we are going to do a substantial tradeoff on all sorts of parameters to make sure that we understand the extent to which we want stealth versus defense suppression. But also, we have decided that we are going to have a much smaller internal carriage payload. For initial strikes in a heavily defended environment we would go in with less of a payload. As the defenses are knocked down, we would be able then to carry more payload on the wing stations and actually lose some of the stealth capability, but carry more in that way. It is going to simplify the design and certainly make the weight problem much more tractable.

I really would not recommend restart of the A–12.

Senator INOUYE. Because of our investment, does the contract give us the title to all the products of R&D?

Mr. CANN. To clarify the situation, there has been much discussion about overruns on the A–12. The contract was never overrun. When the contract was terminated for default, with the exception of $1.3 billion, the Government expects to eventually recover the rest of the funds.

For the $1.3 billion, what was delivered to us was the design and test data on various aspects of some stealth issues and some wind tunnel tests and so forth. What was delivered to us is usable in terms of making sure we do not ever make the same mistake with respect to manufacturing processes and some other things, and also to give us some guidance with respect to how to handle stealth and how to handle certain flight aspects due to the wind tunnel tests.

Basically, what we got for the money that was expended is paper. We are not getting any hardware.

A–X FINAL DESIGN

Senator INOUYE. The final definition of the A–X program is yet to be determined, Admiral. If the final design is a multimission fighter instead of a single-mission attack plane, would this minimize the need for the development of an F/A–18E?

Admiral DUNLEAVY. Sir, the tentative operational requirement is still inside the uniformed Navy. We hope to have the Chief of Naval Operations sign it within the next 2 weeks, to give it to Mr. Cann.

Basically, we want a survivable, long-range, all-weather attack aircraft to replace the A–6. We do say that we would like to have multimission as well as some air-to-air warfare capability, mostly in a defensive mode, if it is affordable.

We are structuring the operational requirement for this aircraft so that the No. 1 priority has to be carrier suitability. It is a given, that if you build an aircraft for the Navy that is going to go aboard ship it has to be carrier suitable.

The next item, the next key item, No. 2, is affordability, and that is why we have rewritten the entire operational requirement for this aircraft. We're reducing the internal payload to maintain its VLO capability, very low observability. As Mr. Cann said, as the campaign wears on you can gradually degrade into a low observable by using external carriage.

We are also questioning stealth. I mean, stealth proved itself very, very well in the Iraqi campaign, but how much stealth do we really need? Again, as Mr. Cann said in the A–12 we asked for 360 degrees, all spectrum stealth. We are asking industry, do we really need 360 degrees, all spectrum stealth? Is there other ways to do that? How much stealth is required?

But the key issue is survivability, will the aircraft survive in a high-threat environment? That, again, should help us drive down the cost. As Mr. Hale said, we are targeting somewhere between $60 and $70 million flyaway cost.

Again, affordability drives it. But, I think the answer to your question is we are working very, very closely to have an operational aircraft that will be multimission as much as we can afford, but then not compromise the survivable long-range, all-weather attack aircraft.

We are asking for a matrix from industry of, with this capability it is going to cost this much and, hopefully, whenever the industry responds to us we will make the judgment of is it worth paying this amount of money for this capability, and we will have the tradeoffs.

The operational requirement should go out to industry in the form of a request for proposals broad enough that at one end of the spectrum the answer could be "son of A–12"; at the other end of the spectrum it could be a derivative of the ATF, or something completely new. So we are flexible, and the specifics have been widened so industry can come back with new ideas or something off the drawing board with derivative capabilities.

So that is what we have been working on very, very hard over the last few months.

Senator INOUYE. So to repeat, what you are looking for is a survivable, all-weather attack aircraft, but if you can afford it multimission and the degree of stealth capability has not been determined?

Admiral DUNLEAVY. We are asking for survivability and stealth; they go hand in hand. We are asking the question of how much stealth is required to make the aircraft survivable? We want to give the kids in the future the ability to hit the target and survive, and that is the basic issue.

Now, the sensors in the aircraft, like the multimission, multicapable radars, have that capability today, so you can go air-to-mud and air-to-air. We have that in our F/A–18 today, so that type of capability is achievable.

But does the basic aircraft design give you all that you want? And again, our primary objective is a long-range, all-weather survivable attack aircraft.

STEALTH TECHNOLOGY

Senator INOUYE. Can you tell us whether the stealth knowledge that we have acquired through the B–2 development will be shared with the A–X manufacturers or developers? I ask this because we have been told that if the A–12 developers were made aware of the experiences of the B–2 developers they might have avoided some of the problems, especially on the cost estimate.

Mr. CANN. Well, let me try to answer this two ways. First of all, we are going to make available to whoever bids on this any stealth information we have in terms of how to go about it.

With respect to the comment about sharing the B–2 knowledge with the contractors, my own view is the problems that existed on the A–12 were not driven so much by the stealth as it was by manufacturing issues, fundamental design problems, and so forth.

But, there is no question that when we go out this time with an RFP we are going to make sure that we provide in a uniform way to everybody, information to allow them to give us the best possible design at the least cost.

ATF DESIGN

Senator INOUYE. We have been told that at least one contractor will submit a design of the Navy ATF as the A–X aircraft. Would this make that aircraft a viable candidate for the A–X?

Mr. CANN. Somehow he is going to have to show us how it meets the requirements. So we will have to wait and see.

Now, we are certainly going to have enough flexibility in the operational requirements to allow people to do significant tradeoffs and to make a case for why it would make more sense to go one way versus another. Clearly, one of the things I am very interested in, as I have an analysis background, is to force our own system to do what I call break point analysis for each parameter. That will tell me where we are starting to pay a premium for each parameter and see if we can balance out the design and convince the operators that we have a good design that will permit them to meet their operational requirements and not break the bank.

One of the big problems in all these developments, whether it is an airplane or anything else, is we tend to pay a premium to get the last 10 percent of capability, and I want to avoid that in the front end. The first 2 years of this program are absolutely, in my judgment, the most critical, because everything will get decided at the time we make the decision to go into the dem-val.

So the front end of this effort is critical, really critical.

Senator INOUYE. I presume that you have looked over the statement of the CBO. Does the affordability concerns make sense to you?

Mr. CANN. I am very concerned about affordability. Affordability depends, as you know, on what the budget looks like. What we have attempted to do in the amended budget submission was to take into account what we believe the budget realities are going to be over the next 5 or 6 years. We are trying to get ourselves the most aircraft on the deck we can possibly get and to put ourselves in the position to phase these two developments in such a way that, if we do this right, the major part of the F/A–18 E/F development will be out of the way by 1995–96, just about the time we are going into the full-scale development for the A–X. Also, the bulk of the production of the F/A–18 E/F will be over by the time we go into production of the A–X. It is a carefully phased program.

Of course, it also depends on making sure that we re-wing all the A–6 aircraft. This is a very important issue, because we need those re-winged aircraft to carry us into the next century.

AIRCRAFT INVENTORIES

Senator INOUYE. Admiral, is there a near-term shortfall in aircraft at this time?

Admiral DUNLEAVY. Referring back to Bob Hale's CBO account, we agree that by about 1999, 2000, we will start to really have a shortfall of aircraft unless we do something smart right now, as we are proposing. But there again, as we have done before, through a lot of management and moving of aircraft and actually basically management of the individual aircraft by series, you can make them last long enough.

But sooner or later, it comes to be very, very hard, and that is the things we are working through right now, in trying to come up with a feasible plan from an operational perspective and also within fiscal constraints.

As Mr. Cann said, we are buying the F/A–18E/F in 1996, getting them in the fleet in 1998, and by that time we are over that hump. We are maintaining capability and flexibility. Hopefully, in about 2001, 2002 the A–X will be coming along and will arrive in the fleet about 2004, 2005. So you have the program we are working hard on.

The CBO report again looked at traditional funding levels of naval aviation. In the last 2 years we lost six major aircraft programs, so that has lowered our share, "our" being naval aviation, of the Navy TOA.

We will come up with a solid plan to rebuild that structure, that floor, if you will, of the naval aviation TOA, a combination of fighter and attack aircraft to structure our airwings. What we were trying to drive through in our opening statements is that we want 60 tactical jets on our aircraft carriers, 12 aircraft carriers.

Ultimately we would like to have 40 strike fighters and 20 A–X aircraft. In the ensuing years you will see shifts in the makeup of that in order to maintain it at 60. The mix of 60 could vary.

How many of the aircraft can we afford? That is the basic question and it is going to take us years to work through that.

Senator INOUYE. Mr. Secretary, Admiral, I thank you very much. You notice I have not asked any question on the 14–D. The next man will do all of that.

Senator D'Amato.

Senator D'AMATO. Thank you very much, Mr. Chairman.

Mr. Chairman, let me suggest that I think that the Navy would like us to get into a pitch and roll back and forth on the F–14D and the F–18, and I do not intend to do that. That is called the old divide and conquer.

They know the merits and the values and the strengths of both of these fine planes and I think they would like to have my good colleague from Missouri and I going at it as to who is going to do what. And I do not think we are going to fall victim to that kind of thing.

I think the question is about the A–12, what an incredible fiasco that was. And now we come to the A–X. Now, the Chief of Naval Operations, Admiral Kelso, testified before the House Armed Services Committee on April 10 that the A–X development would take over 10 years and cost over $10 billion. Now, my guess is that as time passes program costs will not go down.

Would you think that would be a fair analysis? Have you ever seen program costs go down?

Mr. CANN. I never have; no.

Senator D'AMATO. So as a starting off point, we start off with $10 billion, and I thank the Secretary for his comment, because I have not in the short period of time I have been here.

Then the question is, What do we do for the replacement of the A–6 now, not a decade from now? And who is going to tell those young pilots who have been writing unsolicited to this Senator, to others, to Senator Stevens, et cetera, about the worth of planes and what it is going to take to fill that void?

We are talking about re-winging A–6's and adding black boxes to these planes going into the year 2015. That is what we are talking about and I do not think that is a good posture.

So when the chairman talks about whether or not there is going to be a deficiency, whether there is going to be a gap, I do not think, Admiral, your explanation that, Oh yes, but we will work on that, et cetera, really answers the question, because by every reasonable study conducted there is, and will be, a substantial shortfall.

Now, let us look at hurdle No. 1, and that hurdle No. 1 is where are we going to get the funds? The only thing that is certain about the A–X is that it is a budget buster. Plain and simple, it is a budget buster.

And you fellows want your cake and eat it too, and you are willing to overlook the fact that you are going to have old planes out there, that you are going to have to deal with that, and you are willing to say that we are going to sacrifice and create an incredible shortfall, but somehow we are supposed to believe that in the year 2015 or 10 years from now and another 5 years worth of, not development, production, so 15 years from now, we will begin producing the A–X.

Now, I do not think the A–X is ever going to be built. Between now and then it is going to be canceled for the want of funds. Now, that is the reality and that is the future. What kind of position do we find ourselves in then? I ask you that.

How do you square up Admiral Kelso's testimony that the development is going to take over 10 years? What do we do in between? And A–X will cost, at a minimum, $10 billion.

Do you think the tradeoffs are sufficient in terms of what technology that you are going to advance that we should undertake that kind of risk? I do not see the Congress supporting it.

This has nothing to do with the F–14 and the F–18. That is a whole different issue.

Mr. CANN. First of all, there is clearly a requirement for an all-weather aircraft. We have used the A–6 for a long time, as you well know, and, regrettably, as a result of the A–12 we have had to put forth a plan that would re-wing A–6's.

I think that, with respect to the question of the A–X and the length of time it takes and whether it is a budget buster or not, is an issue that still needs to be determined.

But, with respect to the length of time, the 10 years——

Senator D'AMATO. Let me just interrupt at that point. It is an issue that has to be determined. When do we determine it?

Mr. CANN. I was going to get to that, sir.

One of the issues that has to be determined is what the true cost of the full-scale development and what our real estimate of unit cost is going to be. So far, what we have done is to take some essentially paper requirements and make a parametric analysis and come up with a set of numbers.

We have an elaborate process that is clearly going to be driven by the budget considerations. When we get to the 2-year point where we have to make a down-select to get to the dem-val we will certainly have a much, much better idea as to, first of all, what an airplane would look like, what its capability would be, and also what it would cost to develop and to produce.

Now, the key to maintaining the cost posture on the A–X, as far as I am concerned, is to limit the requirements, trying to make sure that what we end up with is a strike aircraft. If we try to get—as the CBO gentleman indicated, if we try to get into multimission aircraft, you get into trouble because you keep having to integrate more and more capability into the aircraft. You have to put more stress on the platform itself, as well as all the combat systems.

So from my point of view as the developer, if there is a valid requirement, we have to find a way to meet it. We have been through all sorts of options in the last year and if we are going to have long-range, all-weather capability to do deep interdiction, we need the stealth capability. There is nothing else that is going to provide us that kind of stealth capability off a carrier except for us to proceed with something like an A–X.

Admiral DUNLEAVY. Senator D'Amato, in answer to your reference of an inventory shortfall, we are looking at re-winging 294 A–6E's. We have 174 of the re-winged aircraft coming into the fleet now. In the budget we have an additional 120 wings.

In addition to that, we hope to upgrade the A–6 reliability and maintainability: CSD's, the constant speed drive—I know you are familiar with those—but also the integrated air defense system, to give the kids more of a chance over the beach by using sophisticated ECM gear, and also the ability to carry more and more of our smart long-range standoff weapons.

Commander Beasel, a young CO who led some strikes off of a Red Sea carrier into an airfield just west of Baghdad, feels confident that if we keep upgrading the aircraft it can survive in combat.

But, the breakeven point is where can we have the inventory shortfall picked up by the A–X later on. We feel confident if we do this right, that will happen. But in the meantime, the carrier decks have to be filled with tactical jets, and our choice is upgrading the F/A–18.

To take strictly numbers shortfalls, in order to keep tactical aircraft, 60 of them on the flight decks, you are going to have a mix of, it could be some day, as many as 48 F/A–18's and 12 of the A–6's in the year 2004, 2005.

Senator D'AMATO. Well, Admiral, I think you just made the point in your statement, and that is if you really—if the Navy wanted to see to it that it could get the most and the best planes on their decks for the next 15 years—we are not talking about 5 years, we are not talking about 10 years, but during the next 15 years—you would keep the F–14's and the F–18's on those decks. You would upgrade them, you would see to it that they would have the most and the best, and you know that really to be the fact.

But you are shooting crap on the come here, and let me suggest this is a pretty big crap shoot. And let me also suggest that you sevened out just before. Now you are coming right back again.

I do not believe this. You went on the A–12. I would not bet on you. My gosh, your performance in the Navy is terrible. That is the A–12 fiasco. Now you come here and you say: Here we go again, fellows; we are going to really literally put on hold the things that we have to do to see to it that our boys are flying the best at the present time.

You are talking about some vague plan. You are talking about $10 billion like it is not $10 billion, and it is more than $10 billion, and you are saying: Do not worry; we are not going to do the same thing with the A–X that we did with the A–12.

What have you learned? I would like to ask you something. In designing the AX, what tradeoffs will be made between stealth, speed, maneuverability, range, payload, as a result of the lessons that you learned from the A–12?

You see, I do not think you learned any lessons. I do not think you ever should have awarded that contract, and you know that. That was a political decision. Well, let us get to it. What lessons did you learn?

Mr. CANN. As I indicated earlier, I have certainly learned a lot of lessons, and I was not here for all this. But, I can tell you that, as I see it, you cannot set in concrete a set of requirements and stick with those requirements without being willing to accept tradeoffs when it becomes clear that either they are unattainable or they are going to drive the weight or be more expensive than you want to pay for.

Senator D'AMATO. Well, when the first contract came in, the very criteria that you are talking about disqualified some of the bidders: they came in with a more costly plan, they came in with a plan that would meet the missions, that weighed too much, and you knocked them out.

Specifically, how will the A–X outperform the current A–6E in the strike role?

Admiral DUNLEAVY. Mostly in survivability.

Senator D'AMATO. Oh, so now we are getting back to the stealth technology again?

Admiral DUNLEAVY. Senator, we are still asking how much of that is enough to counter the threat in the future? Again, the most recent campaign, in Iraq, you saw it: stealth worked.

Again, I hope to God we are not going to walk away with the wrong lessons from the Iraqi campaign, because we had a great integrated air defense system we were facing, we had an air force that was very, very credible, and after about the second or third day the air force left town and, through some damn good bombing, the integrated air defense went away. And our fellows went over there and did a fantastic job.

But stealth is the one that took out some of those key nodes at the early days, that really assisted our fellows to survive in combat.

The driving factor of the A–X as compared to the A–6, it will give the young fellows in the future the capability, the long-range, all-weather attack capability, and survivability. The threat we are looking at—and as Mr. Hale alluded to in his statement—are third world countries that may not be that formidable. In our professional opinion, many third world countries have first-rate threats.

If we are asking our young folks to go into that kind of combat, we ought to give them the best technology America can provide. Our strength is our technology and our people and you saw it demonstrated in the Iraqi campaign.

Senator D'AMATO. Well, let me suggest to you that in the Iraq campaign the conventional aircraft—the F–111, the F–15E, the F/A–18C, the AV–8, the A–10, and the A–6—did one heck of a job.

So whether you are going back to the old tank killer, the A–10, or whether you are going back to the most advanced—and stealth certainly played a part, and this Senator has supported stealth technology. But when we are talking about a $10 billion—and that $10 billion is not going to be $10 billion, and at least the Secretary acknowledged that—$10 billion, we do not see how you come, you sacrifice all of the on-deck capabilities at the present time. You create certainly great shortfalls in that.

You talk about mythically somehow how we are going to integrate, keep working this program, keep advancing the A–X while we keep our Navy and keep our boys in top shape. It is just not there.

The plain truth of the matter is that it is a budget buster. The plain truth of the matter is that you have just got it in your head that we are going to go ahead and we are going to do this regardless of what the consequences are to the force structure as it exists and what the needs are and what the shortfall is.

Now, you have not demonstrated at any one hearing how you are going to pick up that shortfall, and when we do it with charts and numbers—and I have gone through that with you—you do not have any answer for it.

I would suggest it is just like the kid who wants the best and the newest toy that is out there. But these are not toys and this is important, and it is a matter of life and death and, while we do want the best, how do we manage the assets that we have and the assets that we are going to need for at least the next 15 years.

You really have not accounted for how we meet that shortfall. You take on this A–X program, it is a budget buster and we are going to be leaving our force structure, I think, woefully inadequately manned as it relates to giving them the best.

That is how this Senator sees it. I am not going to fall into that trap of fighting the F–14 as opposed to the F–18. They are good planes. You have testified to it. If it comes down to one or the other, why, we will have that out. It seems to me that that is what you would like us to do.

But I think the question is can we afford the A–X. I think it is too big a gamble, that you are saying to us to repeat the same thing and we have not learned the lessons of the past; we have not learned. You have not come to us and demonstrated, I think, sufficiently how you are going to avoid those shortfalls.

I thank the chairman for his patience and I thank the two witnesses.

Senator INOUYE. Before I call upon Senator Specter, I think one of the lessons learned in the gulf was that, if it were not for survivability, stealth, in which we were able to knock out in the first 24 hours the radars, all the other aircraft named by my good friend from New York would not have been able to carry out their missions.

So I think survivability in the A–X, if you are going to develop that, is absolutely essential.

Senator Specter.

Senator SPECTER. Mr. Chairman, might I yield to Senator Bond?

Senator INOUYE. Oh, absolutely.

Senator Bond.

Senator BOND. Thank you, Mr. Chairman and Senator Specter.

FUTURE WITHOUT STEALTH

I might just follow up along the lines the chairman just asked. If we were not to go ahead with the A–X, where do you think we would be 15 years from now without some kind of stealth aircraft? Do you see this as a problem? What would be the longer range projections?

Admiral DUNLEAVY. Once the A–6 reaches the end of its service life, if we do not replace it we lose our long-range, all-weather attack capability. We are looking for 700 miles, the ability to reach out from the carrier, no matter where it is, 700 miles, all-weather. In other words, you can hit the guy with surprise both day and night, lousy weather, in this aircraft and deliver accurate, potent weapons on him in a high-threat environment.

If we ever back off from that, that ability to reach out no matter where you are on the face of this Earth where the carrier is, we Americans lose a heck of a potent punch and that is what we are driving for.

Senator BOND. But I mean, what shortfall do you see if we do not have a new plane in terms of stealth? How important is that stealth capability for 15 years down?

Admiral DUNLEAVY. I think stealth in itself is critical to survivability. Our question is, How much stealth do you have to have built into the airframe-engine combination? Do you need 360 degrees, all spectrum, or can you do it with a less degree by using offboard items and other, electronic warfare and things of that nature combined?

That is what we will be asking industry.

Senator BOND. Are there any aircraft currently in inventory that could be upgraded to fly the 700 miles?

Mr. CANN. No.

Admiral DUNLEAVY. No, sir.

Senator BOND. With respect to the testimony of the CBO, Mr. Hale mentioned how expensive the multirole aircraft would be. Do you think that—well, he mentioned the Air Force's F–111. Do you agree with that assessment, that you cannot have dual mission aircraft?

Mr. CANN. My view of this is that as soon as you try to have dual missions it gets very difficult. We were very fortunate in the design of the F/A–18, because basically we built an aircraft that could do both a fighter and an attack mission, and it was primarily because of careful balancing of those two attributes. Of course, it is a light attack aircraft.

I think as you get into the stealth category, if you want to have a long-range efficient aircraft with survivability a key issue, and then try to add to it a fighter capability, you start to add in problems of supersonic capability and end up with great difficulty balancing the strike mission with affordability, with weight, and with payload. Essentially, you will have to include more capability and more weapon combinations than you probably would like to have.

My own view on this thing is, if we are going to move ahead with an A–X program, that we ought to concentrate on the strike role and, if it is feasible in a block change sense, to add to it AAW capability later on.

The way to preserve that capability is to try to build into the design what I would call a preplanned product improvement concept, but not put the equipment stuff in. You can put in the power and the air conditioning and things like that, but do not start shoving more boxes in, because that is how we end up with problems in weight control.

The No. 1 management tool that I intend to use in the front end of the design of this is to manage by weight. I am going to put a premium on making sure that the weight stays the same, because that is how we lose control of these aircraft, is in the weight.

FA-18 PERFORMANCE IN PERSIAN GULF

Senator BOND. To go back to that question of the dual role, this past week I saw an article in the newspaper where a lieutenant commander came out to thank the workers who had produced the F/A-18 and stated that he and his wing man, fully loaded for a bombing run, encountered two MiG's and were able to shoot down both of the MiG's and then deliver the full amount of the ordnance.

I did not think that—I did not know that that had happened, and I did not know if there were any other examples, if that is a truly once in a lifetime occurrence.

Admiral DUNLEAVY. In that particular campaign, that was the only time we knew it happened.

Mark Fox, he and I used to fly together when he was our aide. The incredible thing about that story you are talking about, his wing man was only in the fleet 10 days. The kid had just arrived in the fleet out of our training system. So it proved again multimission aircraft are the answer.

In that role, by a flip of a switch you go from air-to-mud to air-to-air, shoot down the MiG's, go back to air-to-ground, put four Mark 83's on target, all four aircraft after bagging two MiG's, they go back to their ship and land, they get an OK three wire—the end of a perfect day for a naval aviator.

But it shows you what the young fellow is going to do. American technology in the hands of well-trained naval aviators won that war—all Navy, all services. It was American technology and what we did. Our young people were well trained. And they had the support of the American people—an incredible achievement.

Senator BOND. Well, I would add to that there seemed to be a pretty good command structure, too, and I think that that would be the only thing I would add to that.

FA-18 SURVIVABILITY

A final question. Talking about survivability, did not some of those planes come back having taken fairly significant hits? Did we not have an increased survivability in terms of the ability to fly after they have taken hits with missiles and other ordnance?

Admiral DUNLEAVY. The F/A-18 was built to be a survivable aircraft. It has significantly less vulnerable area. The way the whole aircraft was structured was to give it the ability to take a hit and survive.

In that particular campaign, I personally know of three different instances, all in the Marine Corps, where the F/A-18 took hits and got back onto home plate.

Senator BOND. Thank you very much, Mr. Chairman.

Senator INOUYE. Thank you, Senator Bond.

Senator Specter.

Senator SPECTER. Thank you, Mr. Chairman.

NADC WARMINSTER

Mr. Secretary, shifting the focus to the lab consolidation issue, specifically the Naval Air Development Center at Warminster. I would like to ask you about the factual basis for the recommendations there. Perhaps as good a place as any to start is with a report from Inside the Navy dated March 25, 1991, which reads:

> Secretary Cann is reportedly forcing through a version of the Navy laboratory consolidation plan despite protests from service officials. Sources say that Secretary Cann is quickly moving the plan through in an attempt to avoid congressional oversight by putting his realignments in with the 1991 base closures program before an advisory commission on consolidation can be named.

I ask for your response to that statement?

Mr. CANN. I would be happy to respond to that statement. I have to say in all sincerity that that is not a true statement. None of it is true. I have not forced anything.

As you well know how the base closure process was working, at the same time I returned to the Government a little over a year ago. One of the first things that came up was a desire to look at the whole question of triservice research and development centers. There was a concern that we were not getting the best out of our research and development capability.

We spent the entire summer working with the Office of the Secretary of Defense and with the other two services on trying to understand what would serve the country best in terms of improving our research and development capability. One of the outcomes of that was a request from OSD to the Secretary of the Navy, and he charged me with looking at laboratory consolidation.

One of the things that heightened the need to get on with this laboratory consolidation issue was the fact that the fiscal year 1991 authorization act directed the services to reduce their total acquisition work force by 20 percent over the next 5 years, and that included laboratories, headquarters staff, shipyards, NARF's, and so forth.

So we were faced with, in the case of the laboratory community at least, the way we define the laboratory community, which included our engineering centers and so forth, having to lose up to 19,000 people over that period of time.

Now, what was decided, that as part of the consolidation process—excuse me—the base closure process, that any of the realignments that were going to take place in the laboratory effort that met the criteria of base closure had to be included in that submission. That is the only reference to the base closure issue.

There has been no attempt at all to bypass anything.

Senator SPECTER. Secretary Cann, let me take the next sentence, which has more of a factual content, from this Inside the Navy publication of March 25, 1991, which reads:

> Secretary Cann has also thrown out recent analyses by the Director of Navy Laboratories that revealed significant cost increases under the currently proposed plan, say sources. Instead, Secretary Cann has adopted a plan that shows cost savings under his plan.

My question to you is, Do you dispute the factual assertion here that "the Director of Navy Laboratories revealed significant cost increases under the currently proposed plan"?

Mr. CANN. Well, frankly, I am not sure what Inside the Navy is referring to. But let me tell you my view of this whole issue——

Senator SPECTER. Well, wait a minute. This is not a reference. This is a factual assertion that the Director of Navy Laboratories revealed significant cost increases under the currently proposed plan. Now, you have adequate time to make any comment you like, but I would like to focus, if I may, on that fact, to which this publication, Inside the Navy, refers, and ask you if you disagree with that factual statement that "the Director of Navy Laboratories revealed significant cost increases under the currently proposed plan"?

Mr. CANN. With all due respect, Senator, I have to tell you that I believe that is an assertion on the part of Inside the Navy. I cannot answer the question in the sense that you want me to because there were a number of briefings and I only was involved in a few because my Principal Deputy was working this issue.

The point is, it is clear to me that up front there are costs. There are clearly costs. The question is in the long term, are the long-term costs to the Navy going to be better. I think our general conclusion was that over a long period of time, 5 to 6 years, we would amortize the up-front costs of whatever consolidations we made and that we would, in fact, be in a better position.

Senator SPECTER. Well, to the extent that you are unable to answer the question because there are facts not within your control, I can appreciate that. I would like it if you would supplement your answer for the record after you have had an opportunity to consult with the appropriate sources.

Mr. CANN. I would be delighted to do that.

[The information follows:]

There are up-front costs associated with any realignment, consolidation or closure. Anytime you move or eliminate personnel, there are costs involved. We have carefully estimated the costs associated with the plan using the GAO-approved COBRA model. While the Director of Navy Laboratories [DNL] prepared cost estimates for that portion of the consolidation plan concerned with the Naval Command, Control and Ocean Surveillance Center, he has never performed a cost analysis on the entire plan. The article from Inside the Navy you refer to apparently refers to a preliminary study that was performed by the DNL over a year ago as part of the early tri-service effort associated with the implementation of the Defense Management Report recommendation to consolidate RDT&E facilities. There are differences in the up-front costs between that early study and the current plan due to the fundamental differences in the consolidation concepts that were represented in each.

As an example, the preliminary DNL study proposed two alternatives for the Naval Air Development Center [NADC]. One alternative was totally closing NADC. The cost estimate for this alternative was over $500 million. The cost drivers for the closure of NADC are the MILCON costs associated with moving and/or replicating extensive facilities such as the centrifuge. The second alternative looked at retaining these facilities at Warminster with a minimal workforce to sustain them. The cost estimate for this alternative was approximately $240 million. The current consolidation plan calls for the retention of unique facilities at Warminster plus the utilization of the existing facilities at St. Inigoes, MD, which are to be vacated as part of the consolidation plan, to house the transferring personnel. Using the facilities at St. Inigoes avoids significant MILCON costs. The cost estimate for realigning NADC under the current plan is $184 million. The bottom line is that there are different cost estimates because the proposed actions are different.

Senator SPECTER. Mr. Secretary, the concern that I have about the Naval Air Development Center turns on a number of factors. One is that it is a unique facility with respect to physical qualities. There is a centrifuge there, the mechanism for testing pilots, that is unique.

I am told from my visit to the facility that the centrifuge is located in such a manner that it cannot be duplicated elsewhere. There is a pilot ejection mechanism which I am told was used by the Air Force for the purposes of determining whether pilots could wear chemical gear during the gulf war. I am told further that the Air Force, with its much more extended air facilities than the Navy, did not have equipment to make this testing elsewhere.

I just would like your statement as to how that sort of important equipment, just to mention two items—and there is a long list of similar items—can be duplicated at a savings elsewhere.

Mr. CANN. We have no intention of duplicating them. Items like the inertial lab and the centrifuge up there will be kept in service. We intend to have a group resident at such time after consolidation is over to maintain those facilities and use them as required to support our various test programs.

So, we are not going to take expensive units—as you said, the centrifuge which would be impossible to move on a cost-effective basis, and it would be much less expensive for us to maintain a cadre of people there.

Senator SPECTER. How about the ejector?

Mr. CANN. I am not sure. I think it stays. I will check that for the record. I just do not remember.

Senator SPECTER. Does that not bear significantly on the cost saving, if you have to leave those facilities? What else are you going to leave there?

Mr. CANN. I think those are the only ones.

Senator SPECTER. The only ones?

Mr. CANN. I think. I have to get it for the record.

Senator SPECTER. Would you supply that for the subcommittee?

Mr. CANN. I would be happy to do that.

Senator SPECTER. When you supply this information, would you also supply an analysis of how the impacts on the cost savings are affected by moving some items and keeping others?

Mr. CANN. That was factored into the analysis, but I would be glad to show that.

[The information follows:]

The ejection tower at the Naval Air Development Center [NADC] will be relocated to Patuxent River, MD. There will be two enclaves remaining at Warminster following the realignment of NADC. One of these enclaves will house the Dynamic Flight Simulator (centrifuge) complex and the other will house the navigation facilities. The cost of moving all of the other facilities, including the ejection tower, have been included in the cost analysis provided to the Defense Base Closure and Realignment Commission.

Senator SPECTER. The item which you are counting on moving more easily is personnel. Personnel are allegedly moveable.

Mr. CANN. Allegedly.

Senator SPECTER. I am glad you agree with me on "allegedly."

Your report says that the estimate is that up to 80 percent of the Naval Air Development Center technical personnel will relocate.

My staff, my excellent staff, I might add—where else would I get these questions?

Morrie, do you want to take a bow now or later?—brings me these statistics. If it is analyzing Supreme Court decisions, I do somewhat better than all these statistical matters.

Referring to just a couple of similar relocations for present purposes: a relocation from Frankfort Arsenal to Picatinny Arsenal saw only 7 to 11 percent of the personnel moving; the consolidation of Electro-Optics Lab at Fort Monmouth, NJ, to the Night Vision Lab at Fort Belvoir, VA, a pretty short move, of the 104 people asked to move, only 7 did so. It took between 4 to 5 years for the Electro-Optics Lab to move.

I can give you some first-hand evidence about the people at the Naval Air Development Center. I can even give you an affidavit.

Where do you get an 80-percent figure, Mr. Secretary?

Mr. CANN. Let me try to put this in perspective, if I can. First of all, I am probably one of the great supporters of the Navy lab system. I have been involved with the Navy lab system both inside and out of the Government for over 25 years and I have been in this business 37 years.

This is not a happy time for us, as you can probably imagine. The problem that exists is that we are required by law to draw down 19,000 people across the lab structure. This was required because of the budget which resulted from the budget summit last year. We had to take 22 percent, or thereabouts, out of the budget from May to December.

One of the things that is helping to drive this issue is that all of our laboratories and facilities are NIF, or industrial funded, as you are probably aware. The concern that I have is, if we do not do the consolidation and simultaneously reduce the overhead in a number of places, not just at NADC, we will not be able to maintain those facilities in the fashion that they are being maintained right now over time. We are going to have increased overhead and continue to reduce the direct labor and be in a position where we are doing less and less meaningful work.

Not a happy business, but we have a mandate to try to preserve the technical capability of the Navy and we are trying to put that in appropriate places.

To make one other point which I feel necessary to make, and I regret having to make it, but the naval officers in our Navy move every 2 or 3 years, and those of us who have been in industry have moved in our careers a number of times.

Unfortunately, this is one of those first times or few times when we are going to be asking key Navy civilians to move, because we need to get people co-located in such a way that we can optimize the resources that we are going to have left to preserve the Navy's technical capability.

Senator SPECTER. Well, Mr. Secretary, I am not disagreeing with the issue of asking people to move. I am dealing with the practicalities involved. Experience shows that those who move represent a very small percentage. I have just been able to put my hands on a couple of statistics. I do not have any which support your proposition. If I did, I would make them available. But they are minuscule.

When you release a publication that says "estimated at up to 80 percent of the NADC technical personnel will relocate," I just do not think that is realistic.

So when you say you do not feel badly about asking people to relocate, I am not asking you to feel badly about it. I am just saying who is going to move? When you have these highly skilled people who have done such extraordinary work for such a long time, how realistic—let me just ask you flatly, Mr. Secretary: How realistic do you really think it is that 80 percent of those people will relocate?

Mr. CANN. I guess I would have to read the reference that you are reading from, but I will be very honest, I do not think 80 percent will move.

Now, those who want to stay in this business and who are dedicated to staying in this business will move, and the others will go off into something different. Also, the marketplace is going to dictate what some people do, and if there are other places for them to go into in that area they will stay there. But some will have to move, because if they want to stay in the business they are going to have to go where the business is.

Senator SPECTER. Mr. Secretary, the 80-percent figure comes from your reply to Congressman Kostmayer, dated April 23, 1991:

> Dear Congressman Kostmayer: Thank you for your letter of April 3. As you request in this letter * * * here is the information responsive to your questions.

I want you to take a look at Congressman Kostmayer's questions and your answers, and see if there are any others you disagree with.

I am approaching the issue, Mr. Secretary, solely on the basis of national security. I understand the mandate you are under and this subcommittee is struggling with a 25-percent cut. We know what has to be done.

When I see a facility like the Naval Air Development Center, with the centrifuge, the pilot ejector, the outstanding personnel, and what seems to me to be very strong national security reasons, I am concerned about the recommendation to realign the Naval Air Development Center. Then I see what is happening a few miles to the south of the Philadelphia Navy Yard. One set of figures provided to me shows that 43 percent of the civilian personnel recommended by Navy for elimination are coming from Pennsylvania.

I do not talk much about the job issue, even though that is one of the prime factors to be considered while determining which facilities to close.

I just wonder. When I take a look at the strong case for the Naval Air Development Center and see your basis for moving it, it just, candidly, does not make a lot of sense.

Mr. Chairman, I have quite a number of other questions, but the hour is late. I appreciate the chair's indulgence as always and I will submit my questions for the record.

Nevertheless, I do not want to curtail you from responding to my last statement, Mr. Secretary, because if you wish to reply I am sure the chairman will permit you to answer.

Mr. CANN. Well, I will certainly take them all under advisement. Unfortunately, it sounds like I am being hoisted on my own petard on this one question. I need to get back into it and see what the basis for that statement was, and I will clarify if necessary. But, I will make sure that my rationale is available in the record.

Senator SPECTER. Well, I would appreciate that. And I would appreciate while you revisit the 80-percent figure if you would take a look at closing the NADC.

Thank you.

Senator INOUYE. Thank you.

Gentlemen, as I indicated, this is the first of a series of meetings and hearings in which this subcommittee will participate to discuss the future of naval aviation. Both of us are facing a very difficult and challenging task, when one considers available resources and the mission of the Navy.

This subcommittee will do everything possible to assist you in resolving this. So we look forward to seeing you much more often and working with you.

We would like to thank you, Admiral, and thank you, Mr. Secretary, for joining us this morning and assisting us in starting off our debate. We would like to thank CBO and Mr. Hale for doing the same. It has been very helpful to me and to the subcommittee to begin our debate as we have.

ADDITIONAL COMMITTEE QUESTIONS

[CLERK'S NOTE.—Additional questions submitted by subcommittee members, together with the Department's responses, will appear in the appendix portion of the hearings.]

SUBCOMMITTEE RECESS

Senator INOUYE. The subcommittee will stand in recess until tomorrow, May 9, at 9 a.m., and at that time we will receive testimony from the Commander in Chief of the U.S. European Command, General John R. Galvin.

[Whereupon, at 12:45 p.m., Wednesday, May 8, the subcommittee was recessed, to reconvene at 9 a.m., Thursday, May 9.]

LIST OF WITNESSES, COMMUNICATIONS, AND PREPARED STATEMENTS

Page
Berger, Michael, Navy Analyst, National Security Division, Congressional Budget Office 1053
Butler, Gen. George L., U.S. Air Force, Commander in Chief, Strategic Air Command 965
  Prepared statement 969

Cann, Hon. Gerald A., Assistant Secretary of the Navy for Research, Development, and Acquisition 1083
  Prepared statement 1087
Conver, Hon. Stephen K., Assistant Secretary of the Army (Research, Development, and Acquisition) 935
  Joint prepared statement with General McVey 943
Cooper, Hon. Henry F., Director, Strategic Defense Initiative Organization 999
  Prepared statement 1010
Croker, Maj. Gen. Stephen B., Director of Strategic, Special Operations, and Airlift Programs, U.S. Air Force 849
  Joint prepared statement with Mr. Welch 855

Dunleavy, Vice Adm. Richard, U.S. Navy, Assistant Chief of Naval Operations for Air Warfare 1083

Hale, Robert F., Assistant Director, National Security Division, Congressional Budget Office 1053
  Prepared statement 1061

McVey, Maj. Gen. Peter M., Program Executive Officer for Armored Systems Modernization Program 935
  Joint prepared statement with Hon. Stephen K. Conver 943

Welch, Hon. John J., Jr., Assistant Secretary of the Air Force for Acquisition 849
  Joint prepared statement with General Croker 855

SUBJECT INDEX

CONGRESSIONAL BUDGET OFFICE

Page
- A–X, cost of the 1061
- Alternatives:
  - Four 1054
  - Other differences in the 1058
- Budget constraints 1080
- Meeting long-term needs 1056
- Silver bullet 1060

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE AIR FORCE

OFFICE OF THE ASSISTANT SECRETARY FOR ACQUISITION

- ALQ–161:
  - Core testing 916
  - Reprogramming 927
- B–1 core upgrade 925
- B–2:
  - Assets 912
  - Cost comparison with F–117 859
  - Cost to terminate 903
  - Defect costs 900
  - Military capabilities 910
  - Need for 928
  - Performance problems 902, 921
  - Plan 931
  - Problems 908, 913
  - Prototype 904
  - Stealth advantage 921
  - Targets 905
  - Technical problems 932
  - Test flights 915
  - Testing 853
  - Total cost of fleet 911
  - Weapons 932
- B–52:
  - Inflicted damage 924
  - Reengining 917
- Comparison of:
  - B–2 versus B–52 898
  - B–2/B–1B 906
- Contractor problem status 930
- LHX program 923
- Mobile ICBM's, targeting 929
- Stealth technology, impacts of 850

STRATEGIC AIR COMMAND

- Air Force basing 981
- American national security 975

Page

B–1:
  Buy 977
  Cost 977
  Cost/capability 987
  Flight tests 979
  No. 1 priority 968
  Technology 976
  Weapons load 978
B–52 in Desert Storm 980
Conventional warfighting 983
Defense budget 989
ICBM modernization 983
Integrated warfighting 993
Manned bomber, future role of 967
Mobile launchers 985
National military strategy 968
Nuclear deterrence 993
Philippine negotiations 997
SDI/GPALS 991
Soviet buildup 980
SR–71 986
Tactical Air Command, closer integration with 996
Tanker force 985
Twin Triad 967, 990

DEPARTMENT OF THE ARMY

Armored Systems Modernization Program and budget 948
Army industrial base 953
ASM weight requirement 961
Balancing the force 960
Block III and M–1A2 commonality 955
Light divisions 959
  Armor 960
  Command and controls for 960
Light forces variants 956
Light helicopter cost 949
Line-of-sight antitank [LOSAT] system 958
M–1A3 program cost 952
140 mm gun 963
Pacific issues 957
Program/system priority 952
Shortfall 948
Tank threat assessment study 962
Tanks fielding dates 957
Threat assessment 950

DEPARTMENT OF THE NAVY

A–12, problems with 1089
A–X:
  Final design 1092
  Program 1086
Aircraft inventories 1094
Airwing force structure, new 1084
ATF design 1093
Budget request, fiscal year 1992 1086
Desert Storm experience 1086
FA–18:
  Performance in Persian Gulf 1101
  Survivability 1101
Lessons learned 1090
NADC Warminster 1102
Naval aviation, modernization plan for 1083
Stealth:
  Future without 1099
  Technology 1093

Page

STRATEGIC DEFENSE INITIATIVE ORGANIZATION

ABM interpregation 1042
ABM Treaty:
  Compliance with 1024
  Interpretation 1034
Arrow, status of 1023
Ballistic missiles, countries with 1047
BMD budget evolution 1005
Boost phase intercept 1028
Brilliant pebbles:
  Cost of 1025, 1043
  Management of 1029
  Role of 1025
Capability versus intention 1047
Congressional reductions 1022, 1039
Continued congressional concern 1041
Follow-on technology 1039
GBI and E^{2}I, decision between 1026
Global protection against limited strikes 1000
GPALS:
  Cost of 1021
  Goal of 1048
  Origin of 1032
  Soviet reaction to 1045
Interactive discrimination 1030
JCS requirement 1031
NATO theater missile defense initiative 1029
Near- and far-term technologies, balance between 1007
Nitze test, meeting the 1028
Patriot as justification for SDI 1050
Phase I, basic elements of 1044
Possible alternatives 1033
President's support 1032
SDI:
  Refocus of 1031
  Report 1051
  Selling 1050
SDIO organizational chart 1003
Short-range ballistic missiles 1044
Soviet:
  Actions 1037
  Air defense capabilities 1048
Space-ground R&D investments 1002
SS–18, cost of 1027
Strategic budget 1006
System acquisition cost evolution 1004
Testing, impact of 1042
Theater defense 1038
Timber Wind 1048
Treaty interpretation:
  Cost impact of 1036
  Time impact of 1036

O